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TABLES  
OF THE  
FOUR GREAT SATELLITES  
OF  
JUPITER



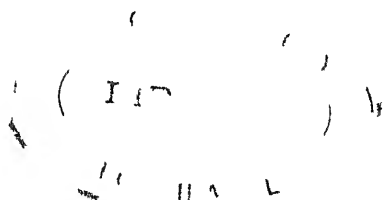


University of Durham Observatory

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TABLES  
OF THE  
FOUR GREAT SATELLITES  
OF  
JUPITER

BY  
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## P R E F A C E

THE *Tables of the Four Great Satellites of Jupiter* have been calculated from formulæ and precepts which I supplied by Mr F C H Carpenter B Sc Observer at Durham Observatory and Mr W F Doak M A Assistant at H M *Nautical Almanac Office* Mr Carpenter taking the major part The Tables were written in MS and verified for the most part by myself the verification was made wherever possible by reconstructing the entries of each Table from its difference columns The type was set up by Messrs Neill & Co Ltd with extreme accuracy and the proofs were read with the MS independently by Mr Carpenter and myself The cost of computation as far as this outran established duty at the Observatory was provided from the Government Grant for Scientific Investigations The cost of publication is borne by the Observatory

R A SAMPSON

UNIVERSITY OF DURHAM OBSERVATORY

1910 *August*



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# INTRODUCTION





# Tables of the Four Great Satellites of Jupiter

## ERRATA

AN erroneous formula has been used for the phenomena of Shadows and Transits (*Mon Not Roy Ast Soc* 1910 Dec) The following directions will correct it The formulæ for Eclipses and Occultations are already correct and are not altered in any respect

*Introduction* p xix for the expressions for the *Reductions to Middle* read

### SATELLITE I

| No | Argument        | Notation of Tables | Eclipse Shadow           | Occultation       | Transit           |
|----|-----------------|--------------------|--------------------------|-------------------|-------------------|
| 1  | $\sin 2h$       | K                  | $\overset{d}{-} 0000399$ | $\overset{d}{ib}$ | $\overset{d}{ib}$ |
| 2  | $\sin (h + h)$  | P                  | $- 000007$               | $ib$              | $ib$              |
| 3  | $\sin (h + h)$  | Q                  | $- 000003$               | $ib$              | $ib$              |
| 4  | $\sin 2d$       | A                  | $+ 000035$               | $ib$              | $ib$              |
| 5  | $\sin H \cos h$ | $\gamma K$         |                          | $- 000065$        | $+ 000065$        |

### SATELLITE II

| No | Argument               | Notation of Tables | Eclipse Shadow           | Occultation       | Transit           |
|----|------------------------|--------------------|--------------------------|-------------------|-------------------|
| 1  | $\sin 2h$              | Q                  | $\overset{d}{-} 0000810$ | $\overset{d}{ib}$ | $\overset{d}{ib}$ |
| 2  | $\sin (h + h)$         | R                  | $- 000264$               | $ib$              | $ib$              |
| 3  | $\sin (h + h)$         | S                  | $- 000016$               | $ib$              | $ib$              |
| 4  | $\sin (h + h_4)$       | T                  | $- 000004$               | $ib$              | $ib$              |
| 5  | $\sin 2h$              | U                  | $- 000021$               | $ib$              | $ib$              |
| 6  | $\sin (\Psi - \omega)$ | P                  | $+ 000019$               | $ib$              | $ib$              |
| 7  | $\sin 2d_3$            | A                  | $+ 000061$               | $ib$              | $ib$              |
| 8  | $\sin H \cos h$        | $\gamma Q$         |                          | $- 000133$        | $+ 000133$        |

### SATELLITE III

| No | Argument                 | Notation of Tables | Eclipse Shadow           | Occultation       | Transit           |
|----|--------------------------|--------------------|--------------------------|-------------------|-------------------|
| 1  | $\sin 2h$                | O                  | $\overset{d}{-} 0001567$ | $\overset{d}{ib}$ | $\overset{d}{ib}$ |
| 2  | $\sin (h + h)$           | P                  | $+ 000019$               | $ib$              | $ib$              |
| 3  | $\sin (h + h)$           | Q                  | $- 000199$               | $ib$              | $ib$              |
| 4  | $\sin (h + h)$           | R                  | $- 000039$               | $ib$              | $ib$              |
| 5  | $\sin 2h_3$              | S                  | $- 000008$               | $ib$              | $ib$              |
| 6  | $\sin (\Psi - \omega)$   | N                  | $+ 000016$               | $ib$              | $ib$              |
| 7  | $\sin (\Psi - \omega_4)$ |                    | $+ 000003$               | $ib$              | $ib$              |
| 8  | $\sin g$                 | D                  | $+ 000008$               | $ib$              | $ib$              |
| 9  | $\sin H \cos h$          | $\gamma O$         |                          | $- 000264$        | $+ 000264$        |

# Tables of the Four Great Satellites of Jupiter

## SATELLITE IV

| No. | Argument                 | Notation<br>of<br>Tables | Eclipse,<br>Shadow | Occultation | Transit     |
|-----|--------------------------|--------------------------|--------------------|-------------|-------------|
| 1   | $\sin 2h_0'''$           | J                        | $-0.002834$        | $ib.$       | $ib.$       |
| 2   | $\sin (h_0''' + h_3''')$ | L                        | $+ .000068$        | $ib.$       | $ib.$       |
| 3   | $\sin (h_0''' + h_4''')$ | K                        | $- .000627$        | $ib.$       | $ib.$       |
| 4   | $\sin 2h_4'''$           | M                        | $- .000035$        | $ib.$       | $ib.$       |
| 5   | $\sin (\Psi - \omega_4)$ | I                        | $+ .000050$        | $ib.$       | $ib.$       |
| 6   | $\sin (\Psi - \omega_3)$ | ..                       | $- .000006$        | $ib.$       | $ib.$       |
| 7   | $\sin g_4'''$            | E                        | $+ .000028$        | $ib.$       | $ib.$       |
| 8   | $\sin H_1 \cos h_0'''$   | $\gamma, J$              | ..                 | $- .000537$ | $+ .000537$ |

P. xxi. In the expressions for *Semiduration*, delete the terms :—

Satellite I, (8);

Satellite III, (9);

Satellite II, (9);

Satellite IV, (9), (15).

In the *Tables of the Semiduration*,

Satellite I : Table XLI, cancel column 3 and employ column 1 for all phenomena ;

Satellite II : cancel Table LV and employ Table LIV for all phenomena ;

Satellite III : cancel Table LV and employ Table LIV for all phenomena ;

Satellite IV : cancel Tables XLIV, XLVIII and employ Tables XLIII, XLVII respectively for all phenomena.

In the *Tables of the Reduction to Middle*, cancel the Tables printed and employ those given below. These require no additional explanation except to point out that the constant portion of the Equation of Light (*Introduction*, p. xxiv) is now applied to one of the minor Tables in place of to the leading Table for each Satellite.

The following errata may also be noted :

*Introduction*, p. xv : delete ° under *Coefficient of Cosine*.

p. 178, Table XXV, with argument **165**, for 1363 read 1263.

p. 208, column 5, for .00000 read 0.0000 and so throughout the column.

# SATELLITE I

## Tables of the Phenomena

XLV

Reduction to Middle

Argument K

|      |           |         | 3    |      |             |          | 3    |      |             |         | 3    |      |             |          | 3    |
|------|-----------|---------|------|------|-------------|----------|------|------|-------------|---------|------|------|-------------|----------|------|
| K    | Ecl<br>Sh | Oc<br>T | Δ    | K    | Ecl<br>Sh   | Oc<br>Tr | Δ    | K    | Ecl<br>Sh   | Oc<br>T | Δ    | K    | Ecl<br>Sh   | Oc<br>Tr | Δ    |
| 0 00 | d<br>- 00 | 070     | - 29 | 0 50 | d<br>+ 0000 | 89       | + 6  | 1 00 | d<br>- 0003 | 62      | - 19 | 1 50 | d<br>+ 0003 | 07       | + 10 |
| 01   |           | 98      | 8    | 51   |             | 115      | 6    | 01   |             | 381     | 18   | 51   |             | 316      | 8    |
| 02   |           | 1 7     | 29   | 52   |             | 14       | 4    | 02   |             | 398     | 17   | 52   |             | 3 2      | 6    |
| 03   |           | 155     | 8    | 53   |             | 163      | 23   | 03   |             | 414     | 15   | 53   |             | 3 6      | 4    |
| 04   |           | 18      | 7    | 54   |             | 186      | 2    | 04   |             | 428     | 13   | 54   |             | 329      | + 2  |
| 05   |           | 209     | 7    | 55   |             | 07       | 1    | 05   |             | 438     | 11   | 55   |             | 329      | 0    |
| 0 06 | - 0002    | 35      | - 26 | 0 56 | + 000       | 7        | + 19 | 1 06 | - 0004      | 48      | - 10 | 1 56 | + 0003      | 28       | - 2  |
| 07   |           | 60      | 5    | 57   |             | 245      | 18   | 07   |             | 457     | 8    | 57   |             | 3 6      | 5    |
| 08   |           | 85      | 25   | 58   |             | 26       | 16   | 08   |             | 463     | 6    | 58   |             | 320      | 7    |
| 09   |           | 309     | 23   | 59   |             | 76       | 14   | 09   |             | 467     | 3    | 59   |             | 31       | 9    |
| 10   |           | 331     | 1    | 60   |             | 289      | 13   | 10   |             | 469     | - 2  | 60   |             | 303      | 10   |
| 0 11 | - 0003    | 51      | - 2  | 0 61 | + 0003      | 01       | + 11 | 1 11 | - 0004      | 69      | 0    | 1 61 | + 0002      | 29       | - 12 |
| 12   |           | 371     | 19   | 62   |             | 311      | 9    | 12   |             | 467     | + 3  | 62   |             | 279      | 14   |
| 13   |           | 389     | 17   | 63   |             | 319      | 7    | 13   |             | 464     | 5    | 63   |             | 64       | 16   |
| 14   |           | 405     | 16   | 64   |             | 3 4      | 4    | 14   |             | 458     | 7    | 64   |             | 247      | 18   |
| 15   |           | 4 0     | 14   | 65   |             | 327      | 3    | 15   |             | 451     | 9    | 65   |             | 9        | 19   |
| 0 16 | - 0004    | 33      | - 12 | 0 66 | + 0032      | 9        | + 1  | 1 16 | - 0004      | 44      | + 11 | 1 66 | + 0002      | 10       | - 1  |
| 17   |           | 443     | 10   | 67   |             | 3 9      | - 1  | 17   |             | 4 8     | 13   | 67   |             | 189      | 2    |
| 18   |           | 45      | 9    | 68   |             | 3 7      | 3    | 18   |             | 416     | 14   | 68   |             | 167      | 3    |
| 19   |           | 460     | 7    | 69   |             | 3 3      | 6    | 19   |             | 401     | 16   | 69   |             | 143      | 5    |
| 20   |           | 465     | 4    | 70   |             | 316      | 8    | 20   |             | 384     | 18   | 70   |             | 119      | 26   |
| 0 21 | - 0004    | 68      | - 2  | 0 71 | + 0003      | 08       | - 9  | 1 21 | - 0003      | 65      | + 20 | 1 71 | + 0 00      | 93       | - 7  |
| 22   |           | 469     | - 1  | 72   |             | 98       | 11   | 22   |             | 346     | 21   | 72   |             | 66       | 27   |
| 23   |           | 468     | + 1  | 73   |             | 286      | 13   | 23   |             | 325     |      | 73   |             | 40       | 28   |
| 24   |           | 466     | 4    | 74   |             | 7        | 15   | 24   |             | 3 1     | 24   | 74   |             | 1        | 28   |
| 25   |           | 461     | 6    | 75   |             | 256      | 17   | 25   |             | 277     | 25   | 75   |             | 16       | 28   |
| 0 26 | - 0004    | 54      | + 8  | 0 76 | + 0002      | 39       | - 18 | 1 26 | - 000       | 53      | + 26 | 1 76 | - 0000      | 44       | - 28 |
| 27   |           | 446     | 10   | 77   |             | 220      | 0    | 27   |             | 27      | 27   | 77   |             | 7        | 29   |
| 28   |           | 435     | 1    | 78   |             | 00       | 21   | 28   |             | 00      | 7    | 78   |             | 101      | 29   |
| 29   |           | 4 3     | 13   | 79   |             | 178      |      | 29   |             | 174     | 28   | 79   |             | 129      | 9    |
| 30   |           | 409     | 15   | 80   |             | 156      | 24   | 30   |             | 146     | 28   | 80   |             | 156      | 8    |
| 0 31 | - 0003    | 93      | + 17 | 0 81 | + 0001      | 13       | - 5  | 1 31 | - 0001      | 18      | + 29 | 1 81 | - 0001      | 84       | - 8  |
| 32   |           | 375     | 19   | 82   |             | 107      | 26   | 32   |             | 89      | 29   | 82   |             | 21       | 7    |
| 33   |           | 356     | 20   | 83   |             | 81       | 27   | 33   |             | 61      | 29   | 83   |             | 38       | 26   |
| 34   |           | 336     | 21   | 84   |             | 54       | 7    | 34   |             | 33      | 8    | 84   |             | 263      | 5    |
| 35   |           | 314     | 23   | 85   |             | 27       | 28   | 35   |             | 5       | 28   | 85   |             | 287      | 24   |
| 0 36 | - 000     | 90      | + 24 | 0 86 | - 00        | 001      | - 8  | 1 36 | + 0000      | 3       | + 28 | 1 86 | - 0003      | 10       | 3    |
| 37   |           | 266     | 25   | 87   |             | 29       | 28   | 37   |             | 51      | 8    | 87   |             | 33       | 2    |
| 38   |           | 241     | 26   | 88   |             | 57       | 28   | 38   |             | 77      | 27   | 88   |             | 353      | 20   |
| 39   |           | 215     | 27   | 89   |             | 85       | 29   | 39   |             | 1 3     | 26   | 89   |             | 37       | 19   |
| 40   |           | 188     | 7    | 90   |             | 114      | 29   | 40   |             | 129     | 25   | 90   |             | 390      | 17   |
| 0 41 | - 0 01    | 61      | + 28 | 0 91 | - 0001      | 42       | - 28 | 1 41 | + 0001      | 52      | + 24 | 1 91 | - 0004      | 06       | - 16 |
| 42   |           | 133     | 28   | 92   |             | 169      | 27   | 42   |             | 176     | 23   | 92   |             | 4 1      | 14   |
| 43   |           | 105     | 29   | 93   |             | 197      | 28   | 43   |             | 197     | 2    | 93   |             | 434      | 12   |
| 44   |           | 76      | 9    | 94   |             | 24       | 26   | 44   |             | 18      | 20   | 94   |             | 444      | 10   |
| 45   |           | 48      | 28   | 95   |             | 249      | 25   | 45   |             | 37      | 19   | 95   |             | 453      | 9    |
| 0 46 | - 0000    | 0       | + 28 | 0 96 | - 000       | 74       | - 5  | 1 46 | + 0002      | 55      | + 17 | 1 96 | - 0004      | 61       | - 7  |
| 47   |           | 8       | 8    | 97   |             | 298      | 23   | 47   |             | 70      | 15   | 97   |             | 465      | 4    |
| 48   |           | 36      | 28   | 98   |             | 320      | 2    | 48   |             | 283     | 14   | 98   |             | 468      | 2    |
| 49   |           | 63      | 7    | 99   |             | 342      | 1    | 49   |             | 296     | 12   | 99   |             | 469      | - 1  |
| 0 50 |           | 89      | + 6  | 1 00 | -           | 362      | - 19 | 1 50 |             | 307     | + 10 | 2 00 | - 0004      | 68       | + 2  |

Appli d C t t 0000 Th E t y m t b p p l m t d b y t h D q t l f T b l XLVI L Tl h l m t b t d b y d d i g t  
it l f i t p d t b y t h V i t d w f m T b l XXV XXIX R S l d w d T l t i t m t l b t d f J p l t P l b y T b l L I

# SATELLITE I

## Tables of the Phenomena

XLVI

Equations of the Reduction

Oc., Tr.

| $\gamma$ | $K$ | $0^d.0$  | $0^d.1$  | $0^d.2$  | $0^d.3$  | $0^d.4$  | $0^d.5$  | $0^d.6$  | $0^d.7$  | $0^d.8$  | $0^d.9$  | $1^d.0$  | $1^d.1$  | $1^d.2$  | $1^d.3$ | $1^d.4$  | $1^d.5$  | $1^d.6$  | $1^d.7$  | $1^d.8$  | $1^d.9$  | $2^d.0$  |
|----------|-----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|
| $d$      |     |          |          |          |          |          |          |          |          |          |          |          |          |          |         |          |          |          |          |          |          |          |
| 0        |     | $\pm 3$  | $\pm 3$  | $\pm 2$  | $\pm 1$  | 0        | $\mp 1$  | $\mp 2$  | $\mp 2$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 2$  | $\mp 1$  | 0       | $\pm 1$  | $\pm 2$  | $\pm 2$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 2$  |
| 20       |     | $\pm 25$ | 23       | 19       | 12       | $\pm 4$  | $\mp 5$  | 13       | 19       | 23       | 25       | 23       | 18       | 11       | $\mp 2$ | $\pm 6$  | 14       | 20       | 24       | 24       | 22       | $\pm 17$ |
| 40       |     | $\pm 43$ | 41       | 33       | 21       | $\pm 7$  | $\mp 9$  | 23       | 34       | 41       | 43       | 40       | 31       | 19       | $\mp 4$ | $\pm 11$ | 25       | 36       | 42       | 43       | 39       | $\pm 30$ |
| 60       |     | $\pm 57$ | 54       | 43       | 28       | $\pm 9$  | $\mp 12$ | 30       | 45       | 55       | 57       | 52       | 41       | 25       | $\mp 5$ | $\pm 15$ | 33       | 47       | 56       | 57       | 51       | $\pm 39$ |
| 80       |     | $\pm 64$ | 60       | 49       | 31       | $\pm 10$ | $\mp 13$ | 34       | 51       | 61       | 64       | 59       | 46       | 28       | $\mp 6$ | $\pm 17$ | 37       | 53       | 62       | 64       | 57       | $\pm 44$ |
| 100      |     | $\pm 64$ | 60       | 48       | 31       | $\pm 10$ | $\mp 13$ | 34       | 51       | 61       | 63       | 58       | 46       | 28       | $\mp 6$ | $\pm 16$ | 37       | 53       | 62       | 63       | 57       | $\pm 43$ |
| 120      |     | $\pm 56$ | 52       | 42       | 27       | $\pm 8$  | $\mp 11$ | 30       | 44       | 53       | 56       | 51       | 40       | 24       | $\mp 5$ | $\pm 14$ | 32       | 46       | 54       | 55       | 50       | $\pm 38$ |
| 140      |     | $\pm 41$ | 39       | 31       | 20       | $\pm 6$  | $\mp 8$  | 22       | 33       | 39       | 41       | 38       | 30       | 18       | $\mp 4$ | $\pm 11$ | 24       | 34       | 40       | 41       | 37       | $\pm 28$ |
| 160      |     | $\pm 22$ | $\pm 21$ | $\pm 17$ | $\pm 11$ | $\pm 3$  | $\mp 4$  | $\mp 12$ | $\mp 17$ | $\mp 21$ | $\mp 22$ | $\mp 20$ | $\mp 16$ | $\mp 10$ | $\mp 2$ | $\pm 6$  | $\pm 13$ | $\pm 18$ | $\pm 21$ | $\pm 22$ | $\pm 20$ | $\pm 15$ |
| 180      |     | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0       | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| 200      |     | $\mp 22$ | $\mp 20$ | $\mp 16$ | $\mp 11$ | $\mp 3$  | $\pm 4$  | $\pm 12$ | $\pm 17$ | $\pm 21$ | $\pm 22$ | $\pm 20$ | $\pm 16$ | $\pm 9$  | $\pm 2$ | $\mp 6$  | $\mp 12$ | $\mp 18$ | $\mp 21$ | $\mp 22$ | $\mp 19$ | $\mp 15$ |
| 220      |     | $\mp 41$ | 39       | 31       | 20       | $\mp 6$  | $\pm 8$  | 22       | 33       | 39       | 41       | 38       | 30       | 18       | $\pm 4$ | $\mp 11$ | 24       | 34       | 40       | 41       | 37       | $\mp 28$ |
| 240      |     | $\mp 56$ | 52       | 42       | 27       | $\mp 8$  | $\pm 11$ | 30       | 44       | 53       | 56       | 51       | 40       | 24       | $\pm 5$ | $\mp 14$ | 32       | 46       | 54       | 55       | 50       | $\mp 38$ |
| 260      |     | $\mp 64$ | 60       | 48       | 31       | $\mp 10$ | $\pm 13$ | 34       | 51       | 61       | 64       | 58       | 46       | 28       | $\pm 6$ | $\mp 16$ | 37       | 53       | 62       | 63       | 57       | $\mp 43$ |
| 280      |     | $\mp 64$ | 60       | 49       | 31       | $\mp 10$ | $\pm 13$ | 34       | 51       | 61       | 64       | 59       | 46       | 28       | $\pm 6$ | $\mp 17$ | 37       | 54       | 63       | 65       | 58       | $\mp 44$ |
| 300      |     | $\mp 57$ | 54       | 43       | 28       | $\mp 9$  | $\pm 12$ | 30       | 45       | 55       | 57       | 53       | 41       | 25       | $\pm 5$ | $\mp 15$ | 33       | 47       | 56       | 57       | 51       | $\mp 39$ |
| 320      |     | $\mp 44$ | 41       | 33       | 21       | $\mp 7$  | $\pm 9$  | 23       | 35       | 42       | 43       | 40       | 31       | 19       | $\pm 4$ | $\mp 11$ | 25       | 36       | 42       | 43       | 39       | $\mp 30$ |
| 340      |     | $\mp 25$ | 23       | 19       | 12       | $\mp 4$  | $\pm 5$  | 13       | 20       | 24       | 25       | 23       | 18       | 11       | $\pm 2$ | $\mp 6$  | 14       | 20       | 24       | 25       | 22       | $\mp 17$ |
| 360      |     | $\mp 3$  | $\mp 3$  | $\mp 2$  | $\mp 1$  | 0        | $\pm 1$  | $\pm 2$  | $\pm 2$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 2$  | $\pm 1$  | 0       | $\mp 1$  | $\mp 2$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 2$  |
| 380      |     | $\pm 19$ | $\pm 18$ | $\pm 14$ | $\pm 9$  | $\pm 3$  | $\mp 4$  | $\mp 10$ | $\mp 15$ | $\mp 18$ | $\mp 19$ | $\mp 17$ | $\mp 14$ | $\mp 8$  | $\mp 2$ | $\pm 5$  | $\pm 11$ | $\pm 16$ | $\pm 18$ | $\pm 19$ | $\pm 17$ | $\pm 13$ |
| 400      |     | $\pm 39$ | $\pm 36$ | $\pm 29$ | $\pm 19$ | $\pm 6$  | $\mp 8$  | $\mp 21$ | $\mp 31$ | $\mp 37$ | $\mp 39$ | $\mp 36$ | $\mp 28$ | $\mp 17$ | $\mp 4$ | $\pm 10$ | $\pm 22$ | $\pm 32$ | $\pm 38$ | $\pm 39$ | $\pm 35$ | $\pm 26$ |

The unit in this Table is  $0^d.000001$ .

No Constant has been added.

The upper sign applies for Occultations, the lower for Transits.

XLVIII

| 1   | 2                     | 1   | 2                     |
|-----|-----------------------|-----|-----------------------|
| A   | Ecl., Oc.<br>Sh., Tr. | A   | Ecl., Oc.<br>Sh., Tr. |
| $d$ | $d$                   | $d$ | $d$                   |
| 0.0 | + '000035             | 2.0 | + '000060             |
| .1  | 46                    | .1  | 66                    |
| .2  | 57                    | .2  | 68                    |
| .3  | 64                    | .3  | 66                    |
| .4  | 68                    | .4  | 60                    |
| .5  | 67                    | .5  | 51                    |
| 0.6 | + '000063             | 2.6 | + '000040             |
| .7  | 55                    | .7  | 28                    |
| .8  | 44                    | .8  | 17                    |
| .9  | 32                    | .9  | 8                     |
| 1.0 | 21                    | 3.0 | 3                     |
| 1.1 | + '000011             | 3.1 | + '000001             |
| .2  | 4                     | .2  | 4                     |
| .3  | 1                     | .3  | 10                    |
| .4  | 3                     | .4  | 20                    |
| .5  | 8                     | .5  | 31                    |
| 1.6 | + '000016             | 3.6 | + '000043             |
| .7  | 27                    | .7  | 54                    |
| .8  | 39                    | .8  | 63                    |
| .9  | 50                    | .9  | 67                    |
| 2.0 | + '000060             | 4.0 | + '000068             |

Added Constant: + $0^d.000035$ .

XLIX

| 1    | 2                     |
|------|-----------------------|
| P    | Ecl., Oc.<br>Sh., Tr. |
| $d$  | $d$                   |
| 0.00 | + '000010             |
| .05  | 8                     |
| .10  | 5                     |
| .15  | 4                     |
| .20  | 3                     |
| .25  | 3                     |
| 0.30 | + '000004             |
| .35  | 6                     |
| .40  | 8                     |
| .45  | 10                    |
| .50  | 13                    |
| 0.55 | + '000015             |
| .60  | 17                    |
| .65  | 18                    |
| .70  | 17                    |
| .75  | 16                    |
| 0.80 | + '000014             |
| .85  | 12                    |
| .90  | 9                     |
| .95  | 7                     |
| 1.00 | + '000004             |

Added Constant: + $0^d.000010$ .

$d$

L

| 1         | 2   | 3         |
|-----------|-----|-----------|
| Ecl., Oc. | Q   | Sh., Tr.  |
| $d$       | $d$ | $d$       |
| + '000041 | 0.0 | + '000009 |
| 39        | .1  | 7         |
| 38        | .2  | 6         |
| 38        | .3  | 6         |
| 40        | .4  | 8         |
| 42        | .5  | 10        |
| + '000044 | 0.6 | + '000012 |
| 44        | .7  | 12        |
| 43        | .8  | 11        |
| 41        | .9  | 9         |
| + '000039 | 1.0 | + '000007 |

Added Constant: + $0^d.000025$ .  
A term of Equation of Light is included.

# SATELLITE II

## Tables of the Phenomena

LVII

Reduction to Middle

Argument Q

| Q    | Ecl<br>Sh  | Oc<br>Tr | 3<br>$\Delta$<br>o <sup>d</sup> or | Q    | Ecl<br>Sh  | Oc<br>T | 3<br>$\Delta$<br>o <sup>d</sup> or | Q    | Ecl<br>Sh  | Oc<br>Tr | 3<br>$\Delta$<br>o <sup>d</sup> or | Q    | Ecl<br>Sh  | O<br>Tr | 3<br>$\Delta$<br>o <sup>d</sup> or |
|------|------------|----------|------------------------------------|------|------------|---------|------------------------------------|------|------------|----------|------------------------------------|------|------------|---------|------------------------------------|
| d    | d          |          |                                    |      |            |         |                                    | d    |            |          |                                    |      |            |         |                                    |
| 0 00 | - 0 0005   | 0        | - 29                               | 1 00 | - 000187   |         | + 26                               | 2 00 | - 0 001077 | - 0      |                                    | 3 00 | + 0 00025  |         | + 11                               |
| 02   |            | 557      | 28                                 | 02   |            | 135     | 26                                 | 02   |            | 1117     | 18                                 | 02   |            | 7       | 9                                  |
| 04   |            | 614      | 29                                 | 04   |            | 84      | 5                                  | 04   |            | 1152     | 17                                 | 04   |            | 87      | 7                                  |
| 06   |            | 671      | 28                                 | 06   | -          | 36      | 24                                 | 06   |            | 1184     | 15                                 | 06   |            | 99      | 5                                  |
| 08   |            | 7 6      | 27                                 | 08   | +          | 9       | 2                                  | 08   |            | 1 13     | 13                                 | 08   |            | 305     | 2                                  |
| 10   |            | 780      | 27                                 | 10   |            | 5       | 21                                 | 10   |            | 1 38     | 1                                  | 10   |            | 308     | + 1                                |
| 0 12 | - 0 000834 |          | - 26                               | 1 12 | + 0 000093 |         | + 0                                | 2 12 | - 0 001 61 | - 1      |                                    | 3 12 | + 0 000309 |         | - 1                                |
| 14   |            | 885      | 25                                 | 14   |            | 131     | 18                                 | 14   |            | 1 79     | 8                                  | 14   |            | 304     | 3                                  |
| 16   |            | 934      | 4                                  | 16   |            | 165     | 16                                 | 16   |            | 1293     | 6                                  | 16   |            | 296     | 5                                  |
| 18   |            | 981      | 3                                  | 18   |            | 196     | 15                                 | 18   |            | 130      | 4                                  | 18   |            | 284     | 7                                  |
| 20   |            | 10 6     | 2                                  | 20   |            | 223     | 13                                 | 20   |            | 1308     | - 2                                | 20   |            | 267     | 10                                 |
| 0 22 | - 0 001069 |          | - 21                               | 1 22 | + 0 000 47 |         | + 11                               | 2 22 | - 0 00131  | 0        |                                    | 3 22 | + 0 000246 |         | - 1                                |
| 24   |            | 1109     | 19                                 | 24   |            | 268     | 9                                  | 24   |            | 1308     | + 2                                | 24   |            | 21      | 13                                 |
| 26   |            | 1145     | 17                                 | 26   |            | 284     | 7                                  | 26   |            | 1301     | 4                                  | 26   |            | 194     | 15                                 |
| 28   |            | 1177     | 16                                 | 28   |            | 97      | 5                                  | 28   |            | 1 91     | 6                                  | 28   |            | 163     | 16                                 |
| 30   |            | 1207     | 14                                 | 30   |            | 304     | 3                                  | 30   |            | 1 77     | 8                                  | 30   |            | 1 9     | 18                                 |
| 0 32 | - 0 001233 |          | - 12                               | 1 32 | + 0 000308 |         | + 1                                | 2 32 | - 0 001260 | + 10     |                                    | 3 32 | + 0 000092 |         | - 20                               |
| 34   |            | 1 56     | 11                                 | 34   |            | 309     | - 1                                | 34   |            | 1237     | 1                                  | 34   |            | 51      | 21                                 |
| 36   |            | 1275     | 9                                  | 36   |            | 305     | 3                                  | 36   |            | 1211     | 14                                 | 36   | +          | 7       | 23                                 |
| 38   |            | 1290     | 6                                  | 38   |            | 98      | 5                                  | 38   |            | 1182     | 15                                 | 38   | -          | 40      | 4                                  |
| 40   |            | 1300     | 4                                  | 40   |            | 287     | 7                                  | 40   |            | 1150     | 17                                 | 40   |            | 88      | 25                                 |
| 0 42 | - 0 001307 |          | - 2                                | 1 42 | + 0 000271 |         | - 9                                | 2 42 | - 0 001114 | + 19     |                                    | 3 42 | - 0 000138 |         | - 5                                |
| 44   |            | 1310     | - 1                                | 44   |            | 251     | 11                                 | 44   |            | 1075     | 20                                 | 44   |            | 189     | 26                                 |
| 46   |            | 1309     | + 2                                | 46   |            | 7       | 13                                 | 46   |            | 1034     | 1                                  | 46   |            | 43      | 27                                 |
| 48   |            | 1303     | 4                                  | 48   |            | 200     | 14                                 | 48   |            | 989      | 3                                  | 48   |            | 297     | 28                                 |
| 50   |            | 1294     | 6                                  | 50   |            | 170     | 16                                 | 50   |            | 94       | 24                                 | 50   |            | 354     | 28                                 |
| 0 52 | - 0 001281 |          | + 8                                | 1 52 | + 0 000137 |         | - 18                               | 2 52 | - 0 000894 | + 25     |                                    | 3 52 | - 0 00041  |         | - 29                               |
| 54   |            | 1 64     | 10                                 | 54   |            | 100     | 19                                 | 54   |            | 843      | 26                                 | 54   |            | 468     | 28                                 |
| 56   |            | 1 42     | 12                                 | 56   |            | 60      | 1                                  | 56   |            | 789      | 7                                  | 56   |            | 5 5     | 8                                  |
| 58   |            | 1 17     | 13                                 | 58   | +          | 17      | 2                                  | 58   |            | 735      | 7                                  | 58   |            | 581     | 28                                 |
| 60   |            | 1189     | 15                                 | 60   | -          | 9       | 24                                 | 60   |            | 680      | 8                                  | 60   |            | 639     | 9                                  |
| 0 62 | - 0 001157 |          | + 16                               | 1 62 | 0 000077   |         | - 25                               | 2 62 | - 0 0006 4 | + 28     |                                    | 3 62 | - 0 000695 |         | - 8                                |
| 64   |            | 11 2     | 18                                 | 64   |            | 127     | 25                                 | 64   |            | 568      | 28                                 | 64   |            | 751     | 7                                  |
| 66   |            | 1084     | 20                                 | 66   |            | 178     | 6                                  | 66   |            | 510      | 29                                 | 66   |            | 8 4     | 26                                 |
| 68   |            | 1043     | 1                                  | 68   |            | 31      | 27                                 | 68   |            | 452      | 29                                 | 68   |            | 856     | 6                                  |
| 70   |            | 999      | 23                                 | 70   |            | 85      | 28                                 | 70   |            | 396      | 28                                 | 70   |            | 907     | 25                                 |
| 0 72 | - 0 000953 |          | + 24                               | 1 72 | - 0 00034  |         | - 28                               | 2 72 | - 0 000339 | + 28     |                                    | 3 72 | - 0 000956 |         | 4                                  |
| 74   |            | 905      | 25                                 | 74   |            | 399     | 9                                  | 74   |            | 84       | 28                                 | 74   |            | 100     |                                    |
| 76   |            | 854      | 26                                 | 76   |            | 456     | 28                                 | 76   |            | 8        | 7                                  | 76   |            | 1045    | 21                                 |
| 78   |            | 801      | 27                                 | 78   |            | 513     | 8                                  | 78   |            | 176      | 26                                 | 78   |            | 1087    | 20                                 |
| 80   |            | 747      | 27                                 | 80   |            | 569     | 8                                  | 80   |            | 124      | 26                                 | 80   |            | 1126    | 18                                 |
| 0 82 | - 0 000692 |          | + 28                               | 1 82 | - 0 000626 |         | - 29                               | 2 82 | - 0 000073 | + 25     |                                    | 3 82 | - 0 001160 |         | - 16                               |
| 84   |            | 636      | 28                                 | 84   |            | 683     | 8                                  | 84   | -          | 25       | 23                                 | 84   |            | 1191    | 15                                 |
| 86   |            | 580      | 8                                  | 86   |            | 739     | 27                                 | 86   | +          | 19       | 22                                 | 86   |            | 1219    | 13                                 |
| 88   |            | 523      | 29                                 | 88   |            | 79      | 7                                  | 88   |            | 61       | 1                                  | 88   |            | 1244    | 12                                 |
| 90   |            | 465      | 29                                 | 90   |            | 845     | 26                                 | 90   |            | 10       | 19                                 | 90   |            | 1266    | 10                                 |
| 0 92 | - 0 00 408 |          | + 28                               | 1 92 | - 0 000896 |         | - 25                               | 2 92 | + 0 000139 | + 17     |                                    | 3 92 | - 0 001 83 |         | - 7                                |
| 94   |            | 351      | 28                                 | 94   |            | 945     | 24                                 | 94   |            | 172      | 16                                 | 94   |            | 1295    | 5                                  |
| 96   |            | 96       | 28                                 | 96   |            | 992     | 23                                 | 96   |            | 03       | 14                                 | 96   |            | 1304    | 3                                  |
| 98   |            | 240      | 27                                 | 98   |            | 1036    | 21                                 | 98   |            | 29       | 12                                 | 98   |            | 1309    | - 2                                |
| 1 00 | - 0 000187 |          | + 26                               | 2 00 | - 0 001077 |         | - 20                               | 3 00 | + 0 000 52 | + 11     |                                    | 4 00 | - 0 001311 |         | 0                                  |

Appl d Co t t 000500 Th E t y m t b p p l m t d b y Eq t l f m T b l LVIII LXV Th w h l m t b t e d b y d d l g t i t s  
p d t b y t h V r i t l d w n f m T b l XXXIII XXXVI F Sh d w d T i t m t l a b t d f J p i t Ph b y T b l LXVI

# SATELLITE II

## Tables of the Phenomena

### Equations of the Reduction

LVIII

LIX

| 1    | 2                      | 3                              | 1    | 2                      | 3                              |
|------|------------------------|--------------------------------|------|------------------------|--------------------------------|
| R    | Ecl., Oc.,<br>Sh., Tr. | $\Delta$<br>0 <sup>d</sup> .01 | R    | Ecl., Oc.,<br>Sh., Tr. | $\Delta$<br>0 <sup>d</sup> .01 |
| d    | d                      |                                | d    | d                      |                                |
| 0.00 | 0.000320               | - 10                           | 1.00 | 0.000422               | + 8                            |
| .02  | 301                    | 9                              | .02  | 438                    | 8                              |
| .04  | 282                    | 9                              | .04  | 455                    | 8                              |
| .06  | 264                    | 9                              | .06  | 471                    | 8                              |
| .08  | 246                    | 9                              | .08  | 486                    | 7                              |
| .10  | 229                    | 9                              | .10  | 500                    | 7                              |
| 0.12 | 0.000212               | - 8                            | 1.12 | 0.000513               | + 6                            |
| .14  | 195                    | 8                              | .14  | 525                    | 6                              |
| .16  | 179                    | 8                              | .16  | 536                    | 6                              |
| .18  | 163                    | 8                              | .18  | 547                    | 5                              |
| .20  | 148                    | 7                              | .20  | 556                    | 4                              |
| 0.22 | 0.000134               | - 7                            | 1.22 | 0.000563               | + 4                            |
| .24  | 122                    | 6                              | .24  | 570                    | 3                              |
| .26  | 110                    | 6                              | .26  | 575                    | 2                              |
| .28  | 100                    | 5                              | .28  | 579                    | 2                              |
| .30  | 90                     | 5                              | .30  | 582                    | 1                              |
| 0.32 | 0.000081               | - 4                            | 1.32 | 0.000584               | + 1                            |
| .34  | 74                     | 3                              | .34  | 584                    | 0                              |
| .36  | 68                     | 3                              | .36  | 583                    | - 1                            |
| .38  | 63                     | 2                              | .38  | 580                    | 2                              |
| .40  | 59                     | 2                              | .40  | 576                    | 2                              |
| 0.42 | 0.000057               | - 1                            | 1.42 | 0.000571               | - 3                            |
| .44  | 56                     | 0                              | .44  | 565                    | 4                              |
| .46  | 57                     | + 1                            | .46  | 557                    | 4                              |
| .48  | 58                     | 1                              | .48  | 548                    | 5                              |
| .50  | 61                     | 2                              | .50  | 538                    | 5                              |
| 0.52 | 0.000065               | + 3                            | 1.52 | 0.000527               | - 6                            |
| .54  | 71                     | 3                              | .54  | 515                    | 6                              |
| .56  | 78                     | 4                              | .56  | 502                    | 7                              |
| .58  | 86                     | 5                              | .58  | 488                    | 7                              |
| .60  | 96                     | 5                              | .60  | 473                    | 8                              |
| 0.62 | 0.000106               | + 6                            | 1.62 | 0.000457               | - 8                            |
| .64  | 118                    | 6                              | .64  | 441                    | 8                              |
| .66  | 130                    | 6                              | .66  | 425                    | 9                              |
| .68  | 143                    | 7                              | .68  | 407                    | 9                              |
| .70  | 157                    | 7                              | .70  | 389                    | 9                              |
| 0.72 | 0.000173               | + 8                            | 1.72 | 0.000371               | - 9                            |
| .74  | 189                    | 8                              | .74  | 353                    | 9                              |
| .76  | 205                    | 8                              | .76  | 334                    | 9                              |
| .78  | 222                    | 9                              | .78  | 316                    | 9                              |
| .80  | 240                    | 9                              | .80  | 297                    | 9                              |
| 0.82 | 0.000258               | + 9                            | 1.82 | 0.000279               | - 9                            |
| .84  | 276                    | 9                              | .84  | 260                    | 9                              |
| .86  | 294                    | 9                              | .86  | 242                    | 9                              |
| .88  | 313                    | 10                             | .88  | 224                    | 9                              |
| .90  | 332                    | 9                              | .90  | 207                    | 8                              |
| 0.92 | 0.000350               | + 9                            | 1.92 | 0.000191               | - 8                            |
| .94  | 368                    | 9                              | .94  | 175                    | 8                              |
| .96  | 387                    | 9                              | .96  | 160                    | 7                              |
| .98  | 405                    | 9                              | .98  | 145                    | 7                              |
| 1.00 | 0.000422               | + 8                            | 2.00 | 0.000131               | - 7                            |

Applied Constant: +0<sup>d</sup>.000320.

| 1   | 2                      | 3                             |
|-----|------------------------|-------------------------------|
| A   | Ecl., Oc.,<br>Sh., Tr. | $\Delta$<br>0 <sup>d</sup> .1 |
| d   | d                      |                               |
| 0.0 | 0.000061               | + 10                          |
| .2  | 82                     | 10                            |
| .4  | 101                    | 9                             |
| .6  | 114                    | 5                             |
| .8  | 121                    | + 2                           |
| 1.0 | 120                    | - 2                           |
| 1.2 | 0.000113               | - 6                           |
| .4  | 97                     | 9                             |
| .6  | 78                     | 10                            |
| .8  | 57                     | 11                            |
| 2.0 | 36                     | 10                            |
| 2.2 | 0.000018               | - 8                           |
| .4  | 6                      | 5                             |
| .6  | 0                      | - 1                           |
| .8  | 2                      | + 3                           |
| 3.0 | 12                     | 7                             |
| 3.2 | 0.000027               | + 9                           |
| .4  | 47                     | 10                            |
| .6  | 69                     | 11                            |
| .8  | 89                     | 10                            |
| 4.0 | 106                    | 8                             |
| 4.2 | 0.000117               | + 4                           |
| .4  | 121                    | + 1                           |
| .6  | 118                    | - 4                           |
| .8  | 108                    | 7                             |
| 5.0 | 91                     | 10                            |
| 5.2 | 0.000071               | - 11                          |
| .4  | 49                     | 11                            |
| .6  | 29                     | 9                             |
| .8  | 12                     | 7                             |
| 6.0 | 3                      | - 3                           |
| 6.2 | 0.000000               | 0                             |
| .4  | 4                      | + 4                           |
| .6  | 17                     | 8                             |
| .8  | 34                     | 10                            |
| 7.0 | 54                     | 11                            |
| 7.2 | 0.000076               | + 10                          |
| .4  | 96                     | 9                             |
| .6  | 112                    | 7                             |
| .8  | 120                    | + 3                           |
| 8.0 | 0.000122               | - 1                           |

Constant: +0<sup>d</sup>.000061.

# SATELLITE II

## Tables of the Phenomena

### Equations of the Reduction

LX

| P    | Ecl Oc Sh Tr |
|------|--------------|
| 1850 | o 000029     |
| 52   | 2            |
| 54   | 14           |
| 56   | 7            |
| 58   |              |
| 60   | o            |
| 1862 | o oo oo      |
| 64   | 5            |
| 66   | 1            |
| 68   | 20           |
| 70   | 27           |
| 1872 | o 000033     |
| 74   | 37           |
| 76   | 38           |
| 78   | 35           |
| 80   | 30           |
| 1882 | o 000022     |
| 84   | 15           |
| 86   | 8            |
| 88   | 3            |
| 90   | 1            |
| 1892 | o 0000       |
| 94   | 6            |
| 96   | 13           |
| 98   |              |
| 1900 | o 000028     |

| P    | Ecl Oc Sh Tr  |
|------|---------------|
| 1900 | d<br>o 000028 |
| 02   | 34            |
| 04   | 38            |
| 06   | 39            |
| 08   | 37            |
| 10   | 31            |
| 1912 | o 0000 4      |
| 14   | 16            |
| 16   | 10            |
| 18   | 4             |
| 20   |               |
| 1922 | o 000003      |
| 24   | 7             |
| 26   | 13            |
| 28   | 21            |
| 30   | 29            |
| 1932 | o 000035      |
| 34   | 39            |
| 36   | 40            |
| 38   | 37            |
| 40   | 32            |
| 1942 | o 000025      |
| 44   | 17            |
| 46   | 10            |
| 48   | 5             |
| 1950 | o 00000       |

| P    | Ecl Oc Sh Tr  |
|------|---------------|
| 1950 | d<br>o 000002 |
| 52   | 3             |
| 54   | 7             |
| 56   | 13            |
| 58   | 20            |
| 60   | 7             |
| 1962 | o 000034      |
| 64   | 38            |
| 66   | 39            |
| 68   | 37            |
| 70   | 31            |
| 1972 | o 000024      |
| 74   | 16            |
| 76   | 9             |
| 78   | 4             |
| 80   | 1             |
| 1982 | o 000001      |
| 84   | 5             |
| 86   | 11            |
| 88   | 18            |
| 90   | 6             |
| 1992 | o 00003       |
| 94   | 37            |
| 96   | 38            |
| 98   | 35            |
| 2000 | o 000030      |

Appli d C t t + 0000

LXI

| S  | Ecl Oc Sh Tr |
|----|--------------|
| d  | d            |
| 00 | o 000020     |
| 1  | 14           |
| 2  | 10           |
| 3  | 6            |
| 4  | 4            |
| 5  | 4            |
| 06 | o 000006     |
| 7  | 10           |
| 8  | 15           |
| 9  | 20           |
| 10 | 26           |
| 11 | o 000031     |
| 2  | 35           |
| 3  | 36           |
| 4  | 36           |
| 5  | 34           |
| 16 | o 000030     |
| 7  | 4            |
| 8  | 19           |
| 9  | 13           |
| 20 | o 000009     |

C ns t + 0000

LXII

| Ecl Oc   | T  | 3        |
|----------|----|----------|
| d        | d  | d        |
| 000075   | 00 | o 0000 3 |
| 73       | 2  | 1        |
| 71       | 4  | 19       |
| 72       | 6  | 20       |
| 74       | 8  | 2        |
| 76       | 10 | 24       |
| o 000078 | 12 | o 0000 6 |
| 79       | 4  | 27       |
| 77       | 6  | 25       |
| 75       | 8  | 23       |
| o 000072 | 20 | 2        |

Appli d C t t + 000049  
Ap t f th Eq ti f Light i f l d d

LXIII

| U  | Ecl Oc Sh Tr | U  | Ecl Oc Sh Tr |
|----|--------------|----|--------------|
| d  | d            | d  | d            |
| 00 | o 000030     | 20 | o 000015     |
| 1  | 23           | 1  | 10           |
| 2  | 16           | 2  | 9            |
| 3  | 11           | 3  | 10           |
| 4  | 9            | 4  | 13           |
| 5  | 9            | 5  | 18           |
| 06 | o 000012     | 26 | o 000025     |
| 7  | 17           | 7  | 32           |
| 8  | 23           | 8  | 40           |
| 9  | 31           | 9  | 46           |
| 10 | 38           | 30 | 50           |
| 11 | o 000045     | 31 | o 000051     |
| 2  | 49           | 2  | 50           |
| 3  | 51           | 3  | 47           |
| 4  | 51           | 4  | 41           |
| 5  | 48           | 5  | 34           |
| 16 | o 000042     | 36 | o 000027     |
| 7  | 36           | 7  | 19           |
| 8  | 28           | 8  | 14           |
| 9  | 21           | 9  | 10           |
| 20 | o 000015     | 40 | o 000009     |

O t t + 00003



# SATELLITE II

## Tables of the Phenomena

LXIV

Equation of the Reduction

Oc., Tr.

| $\gamma$ | $Q$   | 0 <sup>d.0</sup>                            | 0 <sup>d.2</sup>                            | 0 <sup>d.4</sup>                            | 0 <sup>d.6</sup>                            | 0 <sup>d.8</sup>                            | 1 <sup>d.0</sup>                            | 1 <sup>d.2</sup>                            | 1 <sup>d.4</sup>                            | 1 <sup>d.6</sup>                            | 1 <sup>d.8</sup>                            | 2 <sup>d.0</sup>                            | 2 <sup>d.2</sup>                            | 2 <sup>d.4</sup>                            | 2 <sup>d.6</sup>                            | 2 <sup>d.8</sup>                            | 3 <sup>d.0</sup>                            | 3 <sup>d.2</sup>                            | 3 <sup>d.4</sup>                            | 3 <sup>d.6</sup>                            | 3 <sup>d.8</sup>                            | 4 <sup>d.0</sup>           |
|----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
| $\gamma$ | $Q$   | ± 6 ± 6 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                                 | ± 6 ± 5 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                                 | ± 6 ± 5 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                                 | ± 6 ± 5 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                                 | ± 6 ± 5 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                                 | ± 6 ± 5 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                                 | ± 6 ± 5 ± 4                                 | ± 3 ± 1 ± 1                                 | ± 3 ± 5 ± 6                |
| a        | 0   | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6      |
| 10       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6                       | ± 29 27 22 14 ± 5 ± 6      |
| 20       | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10                      | ± 50 47 38 25 ± 8 ± 10     |
| 30       | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14                     | ± 71 66 54 35 ± 11 ± 14    |
| 40       | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17                     | ± 89 84 67 43 ± 14 ± 17    |
| 50       | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20                    | ± 105 98 79 51 ± 17 ± 20   |
| 60       | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23                   | ± 117 110 89 57 ± 18 ± 23  |
| 70       | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25                   | ± 126 119 96 62 ± 20 ± 25  |
| 80       | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26                  | ± 132 124 100 64 ± 21 ± 26 |
| 90       | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26                  | ± 133 125 101 65 ± 21 ± 26 |
| 100      | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26                   | ± 130 123 99 64 ± 21 ± 26  |
| 110      | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24                   | ± 124 117 94 61 ± 20 ± 24  |
| 120      | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22                   | ± 114 107 87 56 ± 18 ± 22  |
| 130      | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20                    | ± 101 95 77 49 ± 16 ± 20   |
| 140      | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17                     | ± 85 80 64 41 ± 13 ± 17    |
| 150      | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13                     | ± 66 62 50 32 ± 10 ± 13    |
| 160      | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9                       | ± 45 42 34 22 ± 7 ± 9      |
| 170      | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4                       | ± 23 22 17 11 ± 4 ± 4      |
| 180      | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
| 190      | ± 23 21 17 11 ± 4 ± 4                       | ± 23 21 17 11 ± 4 ± 4                       | ± 23 21                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |

unit in this Table equals 0<sup>d.000001</sup>.

No Constant has been added.

The upper sign refers to Occultations, the lower to Transits.

# SATELLITE III

## Tables of the Phenomena

LVI

Reduction to Middle

Argument O

| O    | Ecl Oc<br>Sh T | 3<br>Δ<br>o or | O    | Ecl Oc<br>Sh T | 3<br>Δ<br>o o | O    | Ecl O<br>Sh T | 3<br>Δ<br>or | O    | E l Oc<br>Sh Tr | 3<br>Δ<br>o or |
|------|----------------|----------------|------|----------------|---------------|------|---------------|--------------|------|-----------------|----------------|
| d    | d              |                | d    | d              |               | d    | d             |              | d    | d               |                |
| 0 00 | -0 000440      | -27 5          | 2 00 | +0 00 129      | + 5 6         | 4 00 | -0 001499     | - 0 1        | 6 00 | +0 000965       | +1 1           |
| 04   | 55             | 27 5           | 04   | 30             | 4 8           | 04   | 1577          | 18 9         | 04   | 101             | 10 4           |
| 08   | 66             | 27 3           | 08   | 3 7            | 3 9           | 08   | 165           | 17 4         | 08   | 1048            | 8 5            |
| 12   | 768            | 26 8           | 12   | 421            | 3 0           | 12   | 1716          | 15 9         | 12   | 1078            | 6 6            |
| 16   | 874            | 6 3            | 16   | 511            | 1 9           | 16   | 1777          | 14 4         | 16   | 11 1            | 4 9            |
| 20   | 978            | 25 8           | 20   | 596            | 0 6           | 20   | 1831          | 1 6          | 20   | 1117            | 3 0            |
| 0 24 | -0 001080      | -25 1          | 2 24 | +0 00 0676     | +19 4         | 4 24 | -0 00 1878    | -10 9        | 6 24 | +0 0011 5       | + 1 0          |
| 28   | 1179           | 4 4            | 28   | 751            | 17 9          | 28   | 1918          | 9 1          | 28   | 1125            | - 1 0          |
| 32   | 1 75           | 23 4           | 32   | 819            | 16 3          | 32   | 1951          | 7 3          | 32   | 1117            | 9              |
| 36   | 1366           | 21 8           | 36   | 881            | 14 8          | 36   | 1976          | 5 4          | 36   | 11              | 4 8            |
| 40   | 1453           | 21 0           | 40   | 937            | 13 3          | 40   | 1994          | 3 5          | 40   | 1079            | 6 6            |
| 0 44 | -0 001534      | -19 6          | 2 44 | +0 000987      | +11 5         | 4 44 | -0 00 004     | - 1 5        | 6 44 | +0 001049       | - 8 5          |
| 48   | 1610           | 18 3           | 48   | 10 9           | 9 5           | 48   | 0 6           | + 0 5        | 48   | 1 11            | 10 4           |
| 52   | 1680           | 16 8           | 52   | 1063           | 7 6           | 52   | 2000          | 4            | 52   | 966             | 1 1            |
| 56   | 1744           | 15 3           | 56   | 1090           | 5 9           | 56   | 1987          | 4 3          | 56   | 914             | 13 8           |
| 60   | 1802           | 13 6           | 60   | 1110           | 4 1           | 60   | 1966          | 6 1          | 60   | 856             | 15 5           |
| 0 64 | -0 001853      | -11 9          | 2 64 | +0 001123      | + 2 1         | 4 64 | -0 001938     | + 8 0        | 6 64 | +0 00079        | -17 1          |
| 68   | 1897           | 10 1           | 68   | 11 7           | + 0 1         | 68   | 190           | 9 9          | 68   | 719             | 18 5           |
| 72   | 1934           | 8 4            | 72   | 11 4           | - 1 8         | 72   | 1859          | 11 6         | 72   | 64              | 19 9           |
| 76   | 1964           | 6 5            | 76   | 1113           | 3 8           | 76   | 18 9          | 13 3         | 76   | 560             | 1 1            |
| 80   | 1986           | 4 5            | 80   | 1094           | 5 6           | 80   | 1753          | 14 9         | 80   | 473             | 3              |
| 0 84 | -0 00 000      | - 2 6          | 2 84 | +0 001068      | - 7 5         | 4 84 | 001690        | +16 6        | 6 84 | +0 000382       | - 3 4          |
| 88   | 2007           | - 0 6          | 88   | 1034           | 9 4           | 88   | 16 0          | 18 1         | 88   | 286             | 4 4            |
| 92   | 2005           | + 1 4          | 92   | 993            | 11 1          | 92   | 1545          | 19 5         | 92   | 187             | 5 3            |
| 96   | 1996           | 3 1            | 96   | 945            | 12 8          | 96   | 1464          | 0 8          | 96   | 84              | 6 0            |
| 1 00 | 1980           | 5 0            | 3 00 | 891            | 14 5          | 5 00 | 1379          | 1 9          | 7 00 | - 21            | 26 4           |
| 1 04 | -0 001956      | + 7 0          | 3 04 | +0 00 8 9      | -16 3         | 5 04 | -0 001289     | + 3 1        | 7 04 | 0 000127        | - 6 9          |
| 08   | 19 4           | 8 9            | 08   | 761            | 17 8          | 08   | 1194          | 4 3          | 08   | 36              | 7 3            |
| 12   | 1885           | 10 6           | 12   | 687            | 19 1          | 12   | 1095          | 25 0         | 12   | 345             | 7 3            |
| 16   | 1839           | 1 3            | 16   | 608            | 20 4          | 16   | 994           | 5 6          | 16   | 454             | 27 5           |
| 20   | 1787           | 14 0           | 20   | 5 4            | 1 6           | 20   | 890           | 26 3         | 20   | 565             | 7 5            |
| 1 24 | -0 001727      | +15 8          | 3 24 | +0 00 435      | - 8           | 5 24 | -0 00 784     | + 6 9        | 7 24 | -0 00 0674      | -27 1          |
| 28   | 1661           | 17 3           | 28   | 34             | 3 9           | 28   | 675           | 27 3         | 28   | 78              | 6 9            |
| 32   | 1589           | 18 8           | 32   | 244            | 24 9          | 32   | 566           | 27 3         | 32   | 889             | 6 4            |
| 36   | 1511           | 20 1           | 36   | 143            | 5 5           | 36   | 457           | 7 4          | 36   | 993             | 25 6           |
| 40   | 14 8           | 21 3           | 40   | +              | 40            | 40   | 347           | 7 5          | 40   | 1094            | 5 0            |
| 1 44 | -0 001341      | +2 4           | 3 44 | -0 000066      | -26 8         | 5 44 | -0 000 37     | + 7 3        | 7 44 | -0 001193       | - 4 1          |
| 48   | 1249           | 3 6            | 48   | 174            | 27 1          | 48   | 1 9           | 7 0          | 48   | 1 87            | 3 1            |
| 52   | 1152           | 24 6           | 52   | 83             | 27 3          | 52   | - 21          | 6 6          | 52   | 1378            | 2 3            |
| 56   | 1052           | 25 3           | 56   | 39             | 27 4          | 56   | + 84          | 25 9         | 56   | 1465            | 21             |
| 60   | 950            | 25 9           | 60   | 50             | 7 4           | 60   | 186           | 5 1          | 60   | 1546            | 19 5           |
| 1 64 | -0 000845      | +26 6          | 3 64 | -0 000612      | -27 4         | 5 64 | +0 000285     | +24 4        | 7 64 | -0 00 16 1      | -18 0          |
| 68   | 737            | 27 1           | 68   | 721            | 27 1          | 68   | 381           | 23 5         | 68   | 1690            | 16 6           |
| 72   | 628            | 7 3            | 72   | 829            | 26 6          | 72   | 473           | 2 3          | 72   | 1754            | 15 1           |
| 76   | 519            | 7 4            | 76   | 934            | 6             | 76   | 559           | 1 0          | 76   | 1811            | 13 4           |
| 80   | 4 9            | 27 5           | 80   | 1 37           | 25 5          | 80   | 641           | 0 0          | 80   | 1861            | 11 6           |
| 1 84 | -0 000299      | + 7 4          | 3 84 | -0 001138      | -24 6         | 5 84 | +0 000719     | +18 6        | 7 84 | -0 001904       | - 9 9          |
| 88   | 19             | 27 1           | 88   | 1234           | 23 6          | 88   | 790           | 16 9         | 88   | 1940            | 8 1            |
| 92   | - 8            | 26 9           | 92   | 1327           | 22 8          | 92   | 854           | 15 4         | 92   | 1969            | 6 3            |
| 96   | + 5            | 26 4           | 96   | 1416           | 21 5          | 96   | 913           | 13 9         | 96   | 1990            | 4 3            |
| 2 00 | + 129          | +25 6          | 4 00 | -0 001499      | -20 1         | 6 00 | +0 000965     | +12 1        | 8 00 | -0 00 0 3       | - 2 3          |

Appl d C t t 00044 Th E t y m t b t d b y t h E q t f T b l LVII LXIV Th w h l m t b t e d b y d d i g t i t i t  
p d t b y t h V i t i d w n f m T b l XXXIII XXXVI F Sh d d T i t i t m t l b t d f J p t Ph b y T b l LXV

# SATELLITE III

## Tables of the Phenomena

### Equations of the Reduction

LVII

| 1   | 2                      |
|-----|------------------------|
| P   | Ecl., Oc.,<br>Sh., Tr. |
| d   | d                      |
| 0'0 | 0'000020               |
| '1  | 24                     |
| '2  | 27                     |
| '3  | 30                     |
| '4  | 32                     |
| '5  | 35                     |
| 0'6 | 0'000037               |
| '7  | 38                     |
| '8  | 39                     |
| '9  | 39                     |
| 1'0 | 39                     |
| 1'1 | 0'000038               |
| '2  | 37                     |
| '3  | 35                     |
| '4  | 32                     |
| '5  | 29                     |
| 1'6 | 0'000026               |
| '7  | 23                     |
| '8  | 19                     |
| '9  | 16                     |
| 2'0 | 13                     |
| 2'1 | 0'000010               |
| '2  | 7                      |
| '3  | 5                      |
| '4  | 3                      |
| '5  | 2                      |
| 2'6 | 0'000001               |
| '7  | 1                      |
| '8  | 1                      |
| '9  | 2                      |
| 3'0 | 3                      |
| 3'1 | 0'000005               |
| '2  | 8                      |
| '3  | 11                     |
| '4  | 14                     |
| '5  | 17                     |
| 3'6 | 0'000021               |
| '7  | 24                     |
| '8  | 27                     |
| '9  | 30                     |
| 4'0 | 0'000033               |

Constant: +0'000020.

LVIII

| 1    | 2                      | 3                 | 1    | 2                      | 3                 |
|------|------------------------|-------------------|------|------------------------|-------------------|
| Q    | Ecl., Oc.,<br>Sh., Tr. | $\Delta$<br>od'or | Q    | Ecl., Oc.,<br>Sh., Tr. | $\Delta$<br>od'or |
| d    | d                      |                   | d    | d                      |                   |
| 0'00 | 0'000290               | - 3,5             | 2'00 | 0'000362               | + 3,3             |
| '04  | 276                    | 3,5               | '04  | 375                    | 3,2               |
| '08  | 262                    | 3,5               | '08  | 388                    | 3,0               |
| '12  | 248                    | 3,4               | '12  | 399                    | 2,9               |
| '16  | 235                    | 3,4               | '16  | 411                    | 2,9               |
| '20  | 221                    | 3,4               | '20  | 422                    | 2,5               |
| 0'24 | 0'000208               | - 3,3             | 2'24 | 0'000431               | + 2,4             |
| '28  | 195                    | 3,1               | '28  | 441                    | 2,4               |
| '32  | 183                    | 2,9               | '32  | 450                    | 2,1               |
| '36  | 172                    | 2,8               | '36  | 458                    | 1,9               |
| '40  | 161                    | 2,6               | '40  | 465                    | 1,8               |
| 0'44 | 0'000151               | - 2,5             | 2'44 | 0'000472               | + 1,5             |
| '48  | 141                    | 2,4               | '48  | 477                    | 1,1               |
| '52  | 132                    | 2,3               | '52  | 481                    | 1,0               |
| '56  | 123                    | 2,0               | '56  | 485                    | 0,8               |
| '60  | 116                    | 1,8               | '60  | 487                    | 0,4               |
| 0'64 | 0'000109               | - 1,5             | 2'64 | 0'000488               | + 0,2             |
| '68  | 104                    | 1,3               | '68  | 489                    | + 0,1             |
| '72  | 99                     | 1,1               | '72  | 489                    | - 0,2             |
| '76  | 95                     | 0,8               | '76  | 487                    | 0,5               |
| '80  | 93                     | 0,5               | '80  | 485                    | 0,8               |
| 0'84 | 0'000091               | - 0,4             | 2'84 | 0'000481               | - 0,9             |
| '88  | 90                     | - 0,1             | '88  | 478                    | 1,0               |
| '92  | 90                     | + 0,1             | '92  | 473                    | 1,5               |
| '96  | 91                     | 0,4               | '96  | 466                    | 1,6               |
| 1'00 | 93                     | 0,6               | 3'00 | 460                    | 1,8               |
| 1'04 | 0'000096               | + 0,9             | 3'04 | 0'000452               | - 2,1             |
| '08  | 100                    | 1,1               | '08  | 443                    | 2,4               |
| '12  | 105                    | 1,4               | '12  | 433                    | 2,5               |
| '16  | 111                    | 1,6               | '16  | 423                    | 2,6               |
| '20  | 118                    | 1,8               | '20  | 412                    | 2,8               |
| 1'24 | 0'000125               | + 2,0             | 3'24 | 0'000401               | - 2,9             |
| '28  | 134                    | 2,3               | '28  | 389                    | 3,0               |
| '32  | 143                    | 2,4               | '32  | 377                    | 3,2               |
| '36  | 153                    | 2,6               | '36  | 363                    | 3,3               |
| '40  | 164                    | 2,8               | '40  | 351                    | 3,3               |
| 1'44 | 0'000175               | + 2,8             | 3'44 | 0'000337               | - 3,4             |
| '48  | 186                    | 3,0               | '48  | 324                    | 3,4               |
| '52  | 199                    | 3,2               | '52  | 310                    | 3,5               |
| '56  | 212                    | 3,3               | '56  | 296                    | 3,5               |
| '60  | 225                    | 3,3               | '60  | 282                    | 3,5               |
| 1'64 | 0'000238               | + 3,4             | 3'64 | 0'000268               | - 3,5             |
| '68  | 252                    | 3,5               | '68  | 254                    | 3,5               |
| '72  | 266                    | 3,5               | '72  | 240                    | 3,4               |
| '76  | 280                    | 3,5               | '76  | 227                    | 3,3               |
| '80  | 294                    | 3,5               | '80  | 214                    | 3,4               |
| 1'84 | 0'000308               | + 3,5             | 3'84 | 0'000200               | - 3,3             |
| '88  | 322                    | 3,4               | '88  | 188                    | 3,0               |
| '92  | 335                    | 3,4               | '92  | 176                    | 2,9               |
| '96  | 349                    | 3,4               | '96  | 165                    | 2,6               |
| 2'00 | 0'000362               | + 3,3             | 4'00 | 0'000155               | - 2,4             |

Applied Constant: +0'000290.

# SATELLITE III

## Tables of the Phenomena

### Equations of the Reduction

LIX

| R  | Ecl Oc<br>Sh Tr | R  | Ecl Oc<br>Sh Tr |
|----|-----------------|----|-----------------|
| d  | d               | d  | d               |
| 00 | 0 000050        | 20 | 0 000064        |
| 1  | 43              | 1  | 70              |
| 2  | 36              | 2  | 76              |
| 3  | 30              | 3  | 80              |
| 4  | 25              | 4  | 84              |
| 5  | 20              | 5  | 87              |
| 06 | 0 000016        | 26 | 0 000089        |
| 7  | 13              | 7  | 89              |
| 8  | 11              | 8  | 88              |
| 9  | 11              | 9  | 86              |
| 10 | 11              | 30 | 83              |
| 11 | 0 000013        | 31 | 0 000080        |
| 2  | 16              | 2  | 74              |
| 3  | 21              | 3  | 68              |
| 4  | 26              | 4  | 62              |
| 5  | 31              | 5  | 55              |
| 16 | 000037          | 36 | 0 000048        |
| 7  | 44              | 7  | 42              |
| 8  | 51              | 8  | 35              |
| 9  | 58              | 9  | 29              |
| 20 | 0 000064        | 40 | 000024          |

Appli 10 t t + 00005

LX

| S  | Ecl Oc<br>Sh Tr | S  | Ecl Oc<br>Sh T |
|----|-----------------|----|----------------|
| d  | d               | d  | d              |
| 00 | 0 000010        | 40 | 0 000004       |
| 2  | 7               | 2  | 3              |
| 4  | 5               | 4  | 2              |
| 6  | 3               | 6  | 2              |
| 8  | 2               | 8  | 3              |
| 10 | 2               | 50 | 4              |
| 12 | 0 000003        | 52 | 0 000007       |
| 4  | 4               | 4  | 10             |
| 6  | 7               | 6  | 13             |
| 8  | 10              | 8  | 16             |
| 20 | 13              | 60 | 17             |
| 22 | 0 000016        | 62 | 0 000018       |
| 4  | 17              | 4  | 18             |
| 6  | 18              | 6  | 17             |
| 8  | 18              | 8  | 15             |
| 30 | 17              | 70 | 13             |
| 32 | 0 000015        | 72 | 0 000010       |
| 4  | 12              | 4  | 7              |
| 6  | 9               | 6  | 4              |
| 8  | 6               | 8  | 3              |
| 40 | 0 000004        | 80 | 0 000000       |

Appli 10 t t | 0000

LXI

| D  | Ecl Oc<br>Sh Tr | D  | Ecl Oc<br>Sh Tr |
|----|-----------------|----|-----------------|
| d  | d               | d  | d               |
| 00 | 0 000010        | 40 | 0 000007        |
| 2  | 1               | 2  | 6               |
| 4  | 13              | 4  | 5               |
| 6  | 14              | 6  | 4               |
| 8  | 15              | 8  | 3               |
| 10 | 16              | 50 | 2               |
| 12 | 0 000017        | 52 | 0 000000        |
| 4  | 18              | 4  | 2               |
| 6  | 18              | 6  | 2               |
| 8  | 18              | 8  | 2               |
| 20 | 18              | 60 | 3               |
| 22 | 0 000018        | 62 | 0 000004        |
| 4  | 17              | 4  | 5               |
| 6  | 16              | 6  | 6               |
| 8  | 15              | 8  | 7               |
| 30 | 14              | 70 | 8               |
| 32 | 0 000013        | 72 | 0 000010        |
| 4  | 12              | 4  | 12              |
| 6  | 10              | 6  | 13              |
| 8  | 8               | 8  | 14              |
| 40 | 0 000007        | 80 | 0 000015        |

Appli d0 st t + 000

LXII

| Lcl Oc   | N    | 3<br>Sh Tr | Ecl Oc   | N    | 3<br>Sh Tr |
|----------|------|------------|----------|------|------------|
| d        |      | d          | d        |      | d          |
| 0 000085 | 1850 | 0 000035   | 0 000114 | 1925 | 0 000006   |
| 83       | 55   | 37         | 116      | 30   | 4          |
| 82       | 60   | 38         | 116      | 35   | 4          |
| 82       | 65   | 38         | 116      | 40   | 4          |
| 83       | 70   | 37         | 115      | 45   | 5          |
| 84       | 75   | 36         | 113      | 50   | 7          |
| 0 000086 | 1880 | 0 000034   | 0 000110 | 1955 | 0 000010   |
| 89       | 85   | 31         | 1 7      | 60   | 13         |
| 92       | 90   | 8          | 104      | 65   | 16         |
| 96       | 95   | 4          | 1 0      | 70   | 0          |
| 99       | 1900 | 21         | 97       | 75   | 3          |
| 0 000103 | 1905 | 0 000017   | 0 000094 | 1980 | 0 000026   |
| 107      | 10   | 13         | 91       | 85   | 9          |
| 110      | 15   | 10         | 88       | 90   | 3          |
| 113      | 20   | 7          | 87       | 95   | 33         |
| 0 000114 | 1925 | 0 000006   | 0 000086 | 2000 | 0 000034   |

Appli d0 t t + 006  
Ap ti fti Eq ti fLighti i l d d

## Oc., Tr.

The upper sign applies for Occultations, the lower for Transits.

# SATELLITE III

## Tables of the Phenomena

LXIII *continued*

Equation of the Reduction

Oc, Tr

| O<br>γ | 4 <sup>d</sup> 0 | 4 <sup>d</sup> 2 | 4 <sup>d</sup> 4 | 4 <sup>d</sup> 6 | 4 <sup>d</sup> 8 | 5 <sup>d</sup> 0 | 5 <sup>d</sup> 2 | 5 <sup>d</sup> 4 | 5 <sup>d</sup> 6 | 5 <sup>d</sup> 8 | 6 <sup>d</sup> 0 | 6 <sup>d</sup> 2 | 6 <sup>d</sup> 4 | 6 <sup>d</sup> 6 | 6 <sup>d</sup> 8 | 7 <sup>d</sup> 0 | 7 <sup>d</sup> 2 | 7 <sup>d</sup> 4 | 7 <sup>d</sup> 6 | 7 <sup>d</sup> 8 | 8 <sup>d</sup> 0 |
|--------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| d      | 8                | 7                | 6                | 5                | 4                | 3                | 1                |                  | ± 1              | ± 3              | ± 4              | ± 6              | ± 6              | ± 7              | ± 8              | ± 9              | ± 9              | ± 8              | ± 8              | ± 7              | ± 6              |
| 0      | ± 8              | ± 7              | ± 6              | ± 5              | ± 4              | ± 3              | ± 1              |                  | ± 1              | ± 3              | ± 4              | ± 6              | ± 6              | ± 7              | ± 8              | ± 9              | ± 9              | ± 8              | ± 8              | ± 7              | ± 6              |
| 10     | ± 50             | 45               | 41               | 33               | 25               | 17               | ± 8              | ± 2              | 11               | 0                | 28               | 36               | 4                | 47               | 51               | 53               | 54               | 5                | 49               | 45               | ± 40             |
| 20     | ± 90             | 8                | 73               | 60               | 47               | 30               | ± 14             | ± 3              | 19               | 36               | 51               | 65               | 77               | 85               | 9                | 96               | 97               | 95               | 89               | 81               | ± 71             |
| 30     | ± 129            | 117              | 103              | 85               | 66               | 43               | ± 0              | ± 4              | 8                | 51               | 73               | 9                | 108              | 12               | 130              | 136              | 137              | 134              | 118              | 116              | ± 11             |
| 40     | ± 16             | 148              | 130              | 108              | 83               | 54               | ± 5              | ± 5              | 35               | 64               | 93               | 116              | 137              | 154              | 166              | 173              | 174              | 170              | 161              | 147              | ± 18             |
| 50     | ± 191            | 175              | 154              | 118              | 98               | 64               | ± 3              | ± 6              | 42               | 76               | 109              | 138              | 161              | 181              | 195              | 204              | 206              | 201              | 190              | 173              | ± 151            |
| 60     | ± 215            | 197              | 173              | 143              | 11               | 73               | ± 33             | ± 7              | 48               | 85               | 12               | 155              | 182              | 04               | 22               | 29               | 230              | 226              | 14               | 195              | ± 170            |
| 70     | ± 23             | 212              | 187              | 154              | 119              | 79               | ± 36             | ± 8              | 51               | 93               | 13               | 167              | 196              | 220              | 37               | 247              | 249              | 44               | 230              | 21               | ± 183            |
| 80     | ± 243            | 3                | 196              | 162              | 125              | 8                | ± 38             | ± 8              | 53               | 97               | 138              | 175              | 205              | 30               | 48               | 59               | 61               | 255              | 41               | 221              | ± 19             |
| 90     | ± 246            | 22               | 198              | 164              | 16               | 83               | ± 38             | ± 8              | 54               | 98               | 140              | 177              | 208              | 233              | 51               | 62               | 264              | 258              | 244              | 23               | ± 194            |
| 100    | ± 242            | 2                | 194              | 161              | 14               | 81               | ± 37             | ± 8              | 53               | 96               | 137              | 174              | 204              | 230              | 247              | 258              | 60               | 254              | 40               | 20               | ± 190            |
| 110    | ± 31             | 11               | 186              | 154              | 119              | 78               | ± 35             | ± 7              | 50               | 9                | 132              | 166              | 195              | 219              | 235              | 46               | 248              | 24               | 229              | 209              | ± 18             |
| 120    | ± 13             | 194              | 171              | 142              | 109              | 7                | ± 33             | ± 7              | 46               | 85               | 11               | 153              | 180              | 201              | 18               | 27               | 9                | 224              | 21               | 193              | ± 168            |
| 130    | ± 189            | 173              | 152              | 115              | 97               | 64               | ± 9              | ± 6              | 41               | 75               | 107              | 135              | 16               | 179              | 193              | 21               | 202              | 198              | 187              | 171              | ± 149            |
| 140    | ± 158            | 145              | 118              | 106              | 81               | 54               | ± 24             | ± 5              | 34               | 63               | 90               | 115              | 134              | 150              | 162              | 169              | 170              | 166              | 157              | 144              | ± 15             |
| 150    | ± 125            | 114              | 10               | 83               | 63               | 42               | ± 19             | ± 4              | 8                | 50               | 70               | 90               | 105              | 118              | 127              | 133              | 134              | 131              | 124              | 113              | ± 98             |
| 160    | ± 86             | 79               | 69               | 58               | 44               | 9                | ± 13             | ± 3              | 19               | 34               | 49               | 6                | 73               | 8                | 88               | 92               | 92               | 90               | 86               | 79               | ± 68             |
| 170    | ± 45             | 42               | 36               | 3                | 4                | 15               | ± 7              | ± 1              | 10               | 18               | 26               | 3                | 39               | 43               | 46               | 48               | 48               | 47               | 45               | 41               | ± 35             |
| 180    | ± 3              | ± 3              | ± 3              | ± 3              | ± 3              | ± 1              | ± 0              | ± 1              | ± 1              | ± 1              | ± 2              | ± 8              | ± 3              | ± 3              | ± 5              | ± 5              | ± 5              | ± 5              | ± 3              | ± 3              | ± 3              |
| 190    | ± 39             | ± 35             | ± 31             | ± 6              | ± 19             | ± 3              | ± 6              | ± 1              | ± 8              | ± 16             | ± 2              | ± 8              | ± 3              | ± 37             | ± 39             | ± 41             | ± 41             | ± 4              | ± 38             | ± 35             | ± 30             |
| 200    | ± 79             | 72               | 64               | 53               | 41               | 27               | ± 13             | ± 3              | 17               | 3                | 45               | 57               | 67               | 75               | 81               | 85               | 85               | 83               | 78               | 71               | ± 63             |
| 210    | ± 118            | 109              | 97               | 79               | 61               | 40               | ± 19             | ± 4              | 6                | 47               | 67               | 85               | 100              | 112              | 1                | 126              | 117              | 124              | 117              | 108              | ± 93             |
| 220    | ± 154            | 140              | 13               | 1                | 77               | 5                | ± 4              | ± 5              | 33               | 61               | 88               | 110              | 130              | 145              | 157              | 164              | 164              | 161              | 152              | 139              | ± 11             |
| 230    | ± 184            | 168              | 148              | 123              | 9                | 6                | ± 9              | ± 6              | 40               | 73               | 105              | 133              | 155              | 174              | 188              | 196              | 198              | 193              | 183              | 167              | ± 145            |
| 240    | ± 209            | 19               | 169              | 14               | 107              | 7                | ± 33             | ± 7              | 46               | 83               | 119              | 151              | 177              | 199              | 213              | 23               | 24               | 219              | 206              | 19               | ± 165            |
| 250    | ± 9              | 9                | 184              | 15               | 117              | 77               | ± 35             | ± 7              | 50               | 91               | 13               | 164              | 193              | 15               | 33               | 243              | 245              | 240              | 227              | 207              | ± 180            |
| 260    | ± 40             | 2                | 194              | 161              | 124              | 81               | ± 37             | ± 8              | 53               | 96               | 137              | 174              | 204              | 8                | 245              | 256              | 58               | 252              | 38               | 18               | ± 190            |
| 270    | ± 46             | 5                | 198              | 164              | 16               | 83               | ± 38             | ± 8              | 54               | 98               | 14               | 177              | 208              | 33               | 251              | 262              | 264              | 258              | 244              | 3                | ± 194            |
| 280    | ± 43             | 223              | 196              | 162              | 15               | 8                | ± 38             | ± 8              | 53               | 97               | 138              | 175              | 06               | 30               | 248              | 59               | 261              | 255              | 241              | 221              | ± 19             |
| 290    | ± 34             | 5                | 189              | 57               | 12               | 79               | ± 36             | ± 8              | 51               | 93               | 133              | 169              | 198              | 22               | 239              | 50               | 5                | 246              | 33               | 13               | ± 185            |
| 300    | ± 8              | 199              | 175              | 145              | 11               | 73               | ± 33             | ± 7              | 48               | 87               | 14               | 157              | 184              | 06               |                  | 33               | 235              | 228              | 216              | 197              | ± 17             |
| 310    | ± 196            | 179              | 157              | 130              | 10               | 66               | ± 30             | ± 6              | 43               | 78               | 111              | 140              | 166              | 186              | 00               | 208              | 210              | 205              | 194              | 178              | ± 154            |
| 320    | ± 167            | 153              | 135              | 111              | 85               | 57               | ± 5              | ± 5              | 36               | 67               | 95               | 111              | 141              | 158              | 170              | 178              | 179              | 175              | 165              | 151              | ± 13             |
| 330    | ± 133            | 12               | 108              | 9                | 68               | 45               | ± 0              | ± 4              | 30               | 53               | 76               | 97               | 113              | 126              | 137              | 143              | 144              | 141              | 132              | 121              | ± 16             |
| 340    | ± 97             | 89               | 77               | 64               | 49               | 33               | ± 14             | ± 3              | 2                | 38               | 55               | 69               | 81               | 92               | 99               | 103              | 104              | 101              | 96               | 88               | ± 76             |
| 350    | ± 56             | 52               | 45               | 37               | 8                | 19               | ± 8              | ± 2              | 13               | 22               | 32               | 40               | 47               | 53               | 57               | 60               | 60               | 59               | 56               | 51               | ± 44             |
| 360    | ± 15             | ± 14             | ± 11             | ± 1              | ± 8              | ± 5              | ± 0              | ± 4              | ± 6              | ± 6              | ± 9              | ± 10             | ± 13             | ± 14             | ± 15             | ± 15             | ± 15             | ± 15             | ± 14             | ± 13             | ± 11             |
| 370    | ± 28             | ± 5              | ± 3              | ± 19             | ± 14             | ± 9              | ± 5              | ± 1              | ± 6              | ± 11             | ± 16             | ± 0              | ± 3              | ± 26             | ± 8              | ± 30             | ± 30             | ± 29             | ± 8              | ± 5              | ± 5              |
| 380    | ± 69             | 63               | 56               | 46               | 36               | 3                | ± 11             | ± 2              | 15               | 8                | 39               | 50               | 59               | 65               | 70               | 74               | 74               | 72               | 68               | 6                | ± 55             |
| 390    | ± 18             | 10               | 87               | 7                | 56               | 37               | ± 17             | ± 4              | 3                | 43               | 61               | 78               | 92               | 102              | 110              | 115              | 116              | 114              | 107              | 99               | ± 86             |
| 400    | ± 145            | ± 133            | ± 116            | ± 96             | ± 74             | ± 49             | ± 23             | ± 5              | ± 31             | ± 58             | ± 83             | ± 104            | ± 122            | ± 137            | ± 148            | ± 154            | ± 155            | ± 152            | ± 144            | ± 131            | ± 114            |

N O t t h b d d d

l h i t q l o o o

Tl pp lg ppl f O l t a t l t h l f T l t



# SATELLITE IV

## Tables of the Phenomena

LII

Reduction to Middle

Argument J

| J  | Ecl<br>Sh | Oc<br>Tr | 3        |                       | J   | E l<br>Sh | Oc<br>Tr | 3        |                       | J   | Ecl<br>Sh | Oc<br>Tr | 3        |                       | J   | Ecl<br>Sh | Oc<br>Tr | 3        |                       |
|----|-----------|----------|----------|-----------------------|-----|-----------|----------|----------|-----------------------|-----|-----------|----------|----------|-----------------------|-----|-----------|----------|----------|-----------------------|
|    |           |          | $\Delta$ | $\frac{1}{2}\Delta^2$ |     |           |          | $\Delta$ | $\frac{1}{2}\Delta^2$ |     |           |          | $\Delta$ | $\frac{1}{2}\Delta^2$ |     |           |          | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| 00 | -0001100  |          | -13      | 0                     | 50  | +0000554  | +173     | -5       |                       | 100 | -003786   | -68      | +8       |                       | 150 | +0001607  | -63      | -8       |                       |
| 01 |           | 1313     | 13       | +1                    | 51  |           | 72       | 163      | 5                     | 101 |           | 3846     | 53       | 8                     | 151 |           | 1537     | 78       | 8                     |
| 02 |           | 155      | 211      | 1                     | 52  |           | 880      | 153      | 6                     | 102 |           | 3891     | 37       | 8                     | 152 |           | 145      | 93       | 7                     |
| 03 |           | 1735     | 208      |                       | 53  |           | 107      | 141      | 6                     | 103 |           | 390      | 1        | 8                     | 153 |           | 135      | 107      | 7                     |
| 04 |           | 1940     | 04       | 2                     | 54  |           | 1162     | 129      | 7                     | 104 |           | 3933     | -5       | 8                     | 154 |           | 1239     | 121      | 7                     |
| 05 |           | 214      | 199      | 3                     | 55  |           | 1284     | 115      | 7                     | 105 |           | 3930     | +11      | 8                     | 155 |           | 1111     | 133      | 6                     |
| 06 | -000337   |          | -19      | +4                    | 56  | +0001392  | +102     | -7       |                       | 106 | -0003911  | +28      | +8       |                       | 156 | +0000973  | -146     | -6       |                       |
| 07 |           | 525      | 184      | 4                     | 57  |           | 1487     | 87       | 8                     | 107 |           | 3875     | 44       | 8                     | 157 |           | 820      | 158      | 5                     |
| 08 |           | 2705     | 176      | 5                     | 58  |           | 1566     | 72       | 8                     | 108 |           | 383      | 59       | 7                     | 158 |           | 658      | 169      | 5                     |
| 09 |           | 2876     | 166      | 5                     | 59  |           | 1631     | 57       | 8                     | 109 |           | 3758     | 73       | 7                     | 159 |           | 485      | 177      | 4                     |
| 10 |           | 3037     | 156      | 5                     | 60  |           | 1680     | 41       | 8                     | 110 |           | 3677     | 88       | 8                     | 160 |           | 305      | 185      | 4                     |
| 11 | -0003187  |          | -145     | +6                    | 61  | +0001713  | +5       | -8       |                       | 111 | -0003582  | +103     | +7       |                       | 161 | +0000116  | -193     | -4       |                       |
| 12 |           | 3326     | 13       | 7                     | 62  |           | 1730     | +10      | 8                     | 112 |           | 3471     | 117      | 7                     | 162 |           | 81       | 199      | 3                     |
| 13 |           | 3451     | 119      | 7                     | 63  |           | 173      | -7       | 8                     | 113 |           | 3348     | 130      | 7                     | 163 |           | 82       | 204      |                       |
| 14 |           | 3563     | 106      | 7                     | 64  |           | 1717     | 23       | 8                     | 114 |           | 3212     | 143      | 6                     | 164 |           | 488      | 208      | 2                     |
| 15 |           | 3662     | 91       | 8                     | 65  |           | 1686     | 39       | 8                     | 115 |           | 3063     | 154      | 5                     | 165 |           | 698      | 12       | -1                    |
| 16 | 0003745   |          | -76      | +7                    | 66  | +0001640  | -55      | -8       |                       | 116 | -0002904  | +164     | +5       |                       | 166 | -0000911  | -13      | 0        |                       |
| 17 |           | 3814     | 6        | 8                     | 67  |           | 1577     | 70       | 7                     | 117 |           | 2735     | 174      | 5                     | 167 |           | 1124     | 213      | 0                     |
| 18 |           | 3868     | 46       | 8                     | 68  |           | 1501     | 84       | 7                     | 118 |           | 556      | 183      | 4                     | 168 |           | 1337     | 12       | +1                    |
| 19 |           | 3905     | 30       | 8                     | 69  |           | 1409     | 99       | 7                     | 119 |           | 2369     | 191      | 4                     | 169 |           | 1549     | 210      | 1                     |
| 20 |           | 397      | -14      | 8                     | 70  |           | 1303     | 113      | 7                     | 120 |           | 2175     | 197      | 3                     | 170 |           | 1757     | 07       | 2                     |
| 21 | -003933   |          | +8       | +8                    | 71  | +0001183  | -17      | -7       |                       | 121 | -0001975  | +203     | +3       |                       | 171 | -0001963  | -23      | +2       |                       |
| 22 |           | 393      | 18       | 8                     | 72  |           | 1050     | 139      | 6                     | 122 |           | 1770     | 08       | 2                     | 172 |           | 2163     | 198      | 3                     |
| 23 |           | 3897     | 35       | 8                     | 73  |           | 905      | 151      | 6                     | 123 |           | 1560     | 11       | +1                    | 173 |           | 2358     | 191      | 4                     |
| 24 |           | 3854     | 51       | 8                     | 74  |           | 749      | 162      | 5                     | 124 |           | 1348     | 13       | 0                     | 174 |           | 2545     | 183      | 4                     |
| 25 |           | 3796     | 65       | 7                     | 75  |           | 58       | 17       | 5                     | 125 |           | 1135     | 213      | 0                     | 175 |           | 74       | 175      | 4                     |
| 26 | -000374   |          | +80      | +7                    | 76  | +0000406  | -180     | -4       |                       | 126 | -0000922  | +1       | -1       |                       | 176 | -0002894  | -166     | +5       |                       |
| 27 |           | 3636     | 96       | 7                     | 77  |           | 2        | 189      | 4                     | 127 |           | 711      | 211      | 1                     | 177 |           | 3055     | 156      | 6                     |
| 28 |           | 3533     | 109      | 7                     | 78  |           | 29       | 196      | 3                     | 128 |           | 500      | 209      |                       | 178 |           | 3205     | 143      | 7                     |
| 29 |           | 3418     | 12       | 7                     | 79  |           | 170      | 02       | 3                     | 129 |           | 294      | 204      | 2                     | 179 |           | 3340     | 130      | 7                     |
| 30 |           | 389      | 136      | 7                     | 80  |           | 374      | 206      | 2                     | 130 |           | 92       | 200      | 3                     | 180 |           | 3464     | 118      | 7                     |
| 31 | -0003147  |          | +148     | +6                    | 81  | -0000581  | -209     | -2       |                       | 131 | +0000105  | +193     | -4       |                       | 181 | -0003575  | -104     | +7       |                       |
| 32 |           | 994      | 159      | 5                     | 82  |           | 79       | 21       | -1                    | 132 |           | 94       | 186      | 4                     | 182 |           | 3672     | 90       | 7                     |
| 33 |           | 83       | 169      | 4                     | 83  |           | 105      | 213      | 0                     | 133 |           | 476      | 178      | 5                     | 183 |           | 3754     | 75       | 8                     |
| 34 |           | 2656     | 178      | 5                     | 84  |           | 118      | 13       | 0                     | 134 |           | 649      | 168      | 5                     | 184 |           | 3822     | 60       | 8                     |
| 35 |           | 474      | 187      | 5                     | 85  |           | 1431     | 21       | +1                    | 135 |           | 811      | 158      | 6                     | 185 |           | 3874     | 43       | 8                     |
| 36 | -000283   |          | +194     | +3                    | 86  | -0001642  | -210     | +1       |                       | 136 | +0000964  | +146     | -6       |                       | 186 | -0003908  | -7       | +8       |                       |
| 37 |           | 2086     | 200      | 3                     | 87  |           | 1850     | 206      | 3                     | 137 |           | 1103     | 134      | 6                     | 187 |           | 397      | -13      | 8                     |
| 38 |           | 1884     | 205      | 2                     | 88  |           | 253      | 200      | 3                     | 138 |           | 1232     | 122      | 7                     | 188 |           | 3933     | +3       | 8                     |
| 39 |           | 1677     | 09       | 2                     | 89  |           | 25       | 195      | 3                     | 139 |           | 1346     | 108      | 7                     | 189 |           | 392      | 20       | 8                     |
| 40 |           | 1466     | 21       | +1                    | 90  |           | 244      | 188      | 4                     | 140 |           | 1447     | 94       | 7                     | 190 |           | 3894     | 37       | 8                     |
| 41 | -0001254  |          | +213     |                       | 91  | -0002626  | -180     | +4       |                       | 141 | +0001533  | +79      | -8       |                       | 191 | -0003848  | +53      | +7       |                       |
| 42 |           | 1040     | 13       | 0                     | 92  |           | 801      | 171      | 5                     | 142 |           | 1604     | 64       | 8                     | 192 |           | 3789     | 67       | 7                     |
| 43 |           | 828      | 1        | -1                    | 93  |           | 2967     | 161      | 5                     | 143 |           | 1660     | 48       | 8                     | 193 |           | 3714     | 8        | 7                     |
| 44 |           | 617      | 210      | 1                     | 94  |           | 31       | 150      | 6                     | 144 |           | 1701     | 33       | 8                     | 194 |           | 3625     | 97       | 7                     |
| 45 |           | 409      | 207      |                       | 95  |           | 3266     | 138      | 6                     | 145 |           | 175      | +16      | 8                     | 195 |           | 3521     | 111      | 7                     |
| 46 | -000203   |          | +03      | -3                    | 96  | -0003397  | -15      | +7       |                       | 146 | +0001733  | 0        | -8       |                       | 196 | -0003404  | +124     | +6       |                       |
| 47 |           | 4        | 197      | 3                     | 97  |           | 3515     | 112      | 7                     | 147 |           | 1725     | -15      | 8                     | 197 |           | 3273     | 137      | 6                     |
| 48 |           | 190      | 19       | 4                     | 98  |           | 360      | 98       | 7                     | 148 |           | 1703     | 31       | 8                     | 198 |           | 3130     | 149      | 6                     |
| 49 |           | 376      | 182      | 4                     | 99  |           | 3710     | 83       | 8                     | 149 |           | 1663     | 48       | 8                     | 199 |           | 2976     | 160      | 5                     |
| 50 | +0000554  |          | +173     | -5                    | 100 | -0003786  | -68      | +8       |                       | 150 | +0001607  | -63      | -8       |                       | 200 | -0002811  | +170     | +5       |                       |

Appl d C ta t oo oo Tl E ty must b ppl m t d by th Eq ti f m T bl LIII LX Th wh l m t b rr t d by d d g t it t  
p d t by th V r t i d w n f m T bl XXVI XXIX F Sh d d T it m t l b t d f J p i Ph by T bl LXI



# SATELLITE IV

## Tables of the Phenomena

Reductions to Middle

LIII

LIV

| 1   | 2                      | 3        | 1    | 2                      | 3        |
|-----|------------------------|----------|------|------------------------|----------|
| K   | Ecl., Oc.,<br>Sh., Tr. | $\Delta$ | K    | Ecl., Oc.,<br>Sh., Tr. | $\Delta$ |
| d   | d                      |          | d    | d                      |          |
| 0.0 | 0.000750               | - 47     | 5.0  | 0.001115               | + 39     |
| 0.1 | 703                    | 47       | 5.1  | 1153                   | 37       |
| 0.2 | 656                    | 47       | 5.2  | 1188                   | 34       |
| 0.3 | 610                    | 46       | 5.3  | 1220                   | 31       |
| 0.4 | 564                    | 45       | 5.4  | 1250                   | 29       |
| 0.5 | 520                    | 44       | 5.5  | 1277                   | 26       |
| 0.6 | 0.000477               | - 43     | 5.6  | 0.001301               | + 23     |
| 0.7 | 435                    | 41       | 5.7  | 1322                   | 20       |
| 0.8 | 395                    | 39       | 5.8  | 1340                   | 16       |
| 0.9 | 357                    | 37       | 5.9  | 1354                   | 13       |
| 1.0 | 322                    | 34       | 6.0  | 1365                   | 9        |
| 1.1 | 0.000289               | - 32     | 6.1  | 0.001372               | + 5      |
| 1.2 | 258                    | 30       | 6.2  | 1375                   | + 2      |
| 1.3 | 230                    | 26       | 6.3  | 1376                   | - 1      |
| 1.4 | 206                    | 23       | 6.4  | 1373                   | 5        |
| 1.5 | 184                    | 21       | 6.5  | 1366                   | 9        |
| 1.6 | 0.000165               | - 17     | 6.6  | 0.001356               | - 12     |
| 1.7 | 150                    | 14       | 6.7  | 1342                   | 16       |
| 1.8 | 138                    | 10       | 6.8  | 1325                   | 19       |
| 1.9 | 130                    | 7        | 6.9  | 1305                   | 22       |
| 2.0 | 125                    | - 3      | 7.0  | 1281                   | 25       |
| 2.1 | 0.000124               | 0        | 7.1  | 0.001255               | - 28     |
| 2.2 | 126                    | + 4      | 7.2  | 1226                   | 31       |
| 2.3 | 132                    | 8        | 7.3  | 1194                   | 34       |
| 2.4 | 141                    | 11       | 7.4  | 1159                   | 36       |
| 2.5 | 154                    | 15       | 7.5  | 1122                   | 38       |
| 2.6 | 0.000170               | + 18     | 7.6  | 0.001083               | - 40     |
| 2.7 | 189                    | 21       | 7.7  | 1042                   | 42       |
| 2.8 | 212                    | 25       | 7.8  | 1000                   | 43       |
| 2.9 | 238                    | 28       | 7.9  | 956                    | 45       |
| 3.0 | 267                    | 30       | 8.0  | 910                    | 46       |
| 3.1 | 0.000298               | + 33     | 8.1  | 0.000864               | - 46     |
| 3.2 | 332                    | 35       | 8.2  | 818                    | 47       |
| 3.3 | 368                    | 37       | 8.3  | 771                    | 47       |
| 3.4 | 406                    | 39       | 8.4  | 724                    | 47       |
| 3.5 | 446                    | 41       | 8.5  | 677                    | 47       |
| 3.6 | 0.000488               | + 43     | 8.6  | 0.000630               | - 47     |
| 3.7 | 532                    | 45       | 8.7  | 584                    | 46       |
| 3.8 | 577                    | 46       | 8.8  | 539                    | 45       |
| 3.9 | 623                    | 46       | 8.9  | 495                    | 43       |
| 4.0 | 669                    | 47       | 9.0  | 453                    | 42       |
| 4.1 | 0.000716               | + 47     | 9.1  | 0.000412               | - 40     |
| 4.2 | 763                    | 47       | 9.2  | 373                    | 38       |
| 4.3 | 810                    | 47       | 9.3  | 337                    | 35       |
| 4.4 | 857                    | 47       | 9.4  | 303                    | 33       |
| 4.5 | 903                    | 46       | 9.5  | 272                    | 31       |
| 4.6 | 0.000948               | + 45     | 9.6  | 0.000242               | - 28     |
| 4.7 | 992                    | 44       | 9.7  | 216                    | 25       |
| 4.8 | 1035                   | 42       | 9.8  | 192                    | 22       |
| 4.9 | 1076                   | 40       | 9.9  | 172                    | 18       |
| 5.0 | 0.001115               | + 39     | 10.0 | 0.000156               | - 14     |

Applied Constant: +0.000750.

| 1    | 2                      | 3                 |
|------|------------------------|-------------------|
| L    | Ecl., Oc.,<br>Sh., Tr. | $\Delta$<br>od. r |
| d    | d                      |                   |
| 0.0  | 0.000100               | + 6               |
| 0.2  | 111                    | 5                 |
| 0.4  | 120                    | 5                 |
| 0.6  | 130                    | 5                 |
| 0.8  | 139                    | 4                 |
| 1.0  | 146                    | 4                 |
| 1.2  | 0.000153               | + 3               |
| 1.4  | 159                    | 3                 |
| 1.6  | 164                    | 2                 |
| 1.8  | 167                    | + 1               |
| 2.0  | 168                    | 0                 |
| 2.2  | 0.000168               | - 1               |
| 2.4  | 166                    | 1                 |
| 2.6  | 163                    | 2                 |
| 2.8  | 158                    | 3                 |
| 3.0  | 153                    | 3                 |
| 3.2  | 0.000146               | - 4               |
| 3.4  | 138                    | 5                 |
| 3.6  | 128                    | 5                 |
| 3.8  | 118                    | 5                 |
| 4.0  | 109                    | 5                 |
| 4.2  | 0.000098               | - 5               |
| 4.4  | 89                     | 5                 |
| 4.6  | 78                     | 5                 |
| 4.8  | 69                     | 5                 |
| 5.0  | 60                     | 4                 |
| 5.2  | 0.000053               | - 4               |
| 5.4  | 46                     | 3                 |
| 5.6  | 40                     | 3                 |
| 5.8  | 36                     | 2                 |
| 6.0  | 33                     | - 1               |
| 6.2  | 0.000032               | 0                 |
| 6.4  | 33                     | + 1               |
| 6.6  | 34                     | 1                 |
| 6.8  | 38                     | 2                 |
| 7.0  | 42                     | 3                 |
| 7.2  | 0.000048               | + 3               |
| 7.4  | 55                     | 4                 |
| 7.6  | 64                     | 5                 |
| 7.8  | 73                     | 5                 |
| 8.0  | 82                     | 5                 |
| 8.2  | 0.000093               | + 5               |
| 8.4  | 103                    | 5                 |
| 8.6  | 113                    | 5                 |
| 8.8  | 123                    | 5                 |
| 9.0  | 132                    | 5                 |
| 9.2  | 0.000141               | + 4               |
| 9.4  | 149                    | 4                 |
| 9.6  | 155                    | 3                 |
| 9.8  | 160                    | 2                 |
| 10.0 | 0.000164               | + 2               |

Applied Constant: +0.000000.

# SATELLITE IV

## Tables of the Phenomena

### Reductions to Middle

LV

| M   | Ecl<br>Sh | Oc<br>Tr | M   | Ecl<br>Sh | Oc<br>T |
|-----|-----------|----------|-----|-----------|---------|
| d   | d         |          | d   | d         |         |
| 00  | 0 0000    | 50       | 100 | 0 0000    | 17      |
| 02  |           | 45       | 102 |           | 17      |
| 04  |           | 40       | 104 |           | 16      |
| 06  |           | 35       | 106 |           | 16      |
| 08  |           | 30       | 108 |           | 17      |
| 10  |           | 26       | 110 |           | 18      |
| 12  | 0 0000    | 23       | 112 | 0 0000    | 21      |
| 14  |           | 20       | 114 |           | 4       |
| 16  |           | 18       | 116 |           | 8       |
| 18  |           | 17       | 118 |           | 3       |
| 20  |           | 16       | 120 |           | 37      |
| 22  | 0 0000    | 16       | 122 | 0 0000    | 42      |
| 24  |           | 17       | 124 |           | 47      |
| 26  |           | 18       | 126 |           | 53      |
| 28  |           | 20       | 128 |           | 57      |
| 30  |           | 23       | 130 |           | 62      |
| 32  | 0 0000    | 7        | 132 | 0 0000    | 67      |
| 34  |           | 31       | 134 |           | 71      |
| 36  |           | 36       | 136 |           | 75      |
| 38  |           | 41       | 138 |           | 78      |
| 40  |           | 46       | 140 |           | 81      |
| 42  | 0 0000    | 51       | 142 | 0 0000    | 83      |
| 44  |           | 56       | 144 |           | 85      |
| 46  |           | 61       | 146 |           | 84      |
| 48  |           | 66       | 148 |           | 84      |
| 50  |           | 70       | 150 |           | 83      |
| 52  | 0 0000    | 74       | 152 | 0 0000    | 81      |
| 54  |           | 77       | 154 |           | 78      |
| 56  |           | 80       | 156 |           | 75      |
| 58  |           | 82       | 158 |           | 71      |
| 60  |           | 84       | 160 |           | 67      |
| 62  | 0 0000    | 85       | 162 | 0 0000    | 63      |
| 64  |           | 84       | 164 |           | 58      |
| 66  |           | 83       | 166 |           | 53      |
| 68  |           | 82       | 168 |           | 48      |
| 70  |           | 79       | 170 |           | 42      |
| 72  | 0 0000    | 76       | 172 | 0 0000    | 37      |
| 74  |           | 72       | 174 |           | 33      |
| 76  |           | 68       | 176 |           | 29      |
| 78  |           | 64       | 178 |           | 24      |
| 80  |           | 59       | 180 |           | 21      |
| 82  | 0 0000    | 54       | 182 | 0 0000    | 18      |
| 84  |           | 49       | 184 |           | 17      |
| 86  |           | 43       | 186 |           | 17      |
| 88  |           | 38       | 188 |           | 17      |
| 90  |           | 34       | 190 |           | 16      |
| 92  | 0 0000    | 30       | 192 | 0 0000    | 16      |
| 94  |           | 25       | 194 |           | 17      |
| 96  |           | 22       | 196 |           | 18      |
| 98  |           | 19       | 198 |           | 2       |
| 100 | 0 0000    | 17       | 200 | 0 0000    | 25      |

Appli d C ta t + 00005

LVI

| E   | Ecl<br>Sh | Oc<br>Tr |
|-----|-----------|----------|
| d   |           |          |
| 00  | 0 00      | 050      |
| 05  |           | 55       |
| 10  |           | 60       |
| 15  |           | 65       |
| 20  |           | 69       |
| 25  |           | 73       |
| 30  | 0 0000    | 75       |
| 35  |           | 77       |
| 40  |           | 78       |
| 45  |           | 78       |
| 50  |           | 77       |
| 55  | 0 0000    | 75       |
| 60  |           | 72       |
| 65  |           | 68       |
| 70  |           | 64       |
| 75  |           | 59       |
| 80  | 0 0000    | 54       |
| 85  |           | 48       |
| 90  |           | 43       |
| 95  |           | 38       |
| 100 |           | 34       |
| 105 | 0 0000    | 30       |
| 110 |           | 6        |
| 115 |           | 4        |
| 120 |           | 3        |
| 125 |           |          |
| 130 | 0 0000    | 22       |
| 135 |           | 4        |
| 140 |           | 6        |
| 145 |           | 29       |
| 150 |           | 33       |
| 155 | 0 0000    | 38       |
| 160 |           | 43       |
| 165 |           | 48       |
| 170 |           | 53       |
| 175 |           | 58       |
| 180 | 0 0000    | 63       |
| 185 |           | 68       |
| 190 |           | 71       |
| 195 |           | 74       |
| 200 | 0 0000    | 77       |

0 t t + 00005

LVII

| I    | Ecl<br>Sh | Oc<br>Tr |
|------|-----------|----------|
| 1850 | 0 0001    | 77       |
| 60   |           | 179      |
| 70   |           | 181      |
| 80   |           | 181      |
| 90   |           | 18       |
| 1900 |           | 182      |
| 1910 | 0 0001    | 83       |
| 20   |           | 186      |
| 30   |           | 189      |
| 40   |           | 194      |
| 50   |           | 201      |
| 1960 | 0 0002    | 09       |
| 70   |           | 218      |
| 80   |           | 226      |
| 90   |           | 234      |
| 2000 | 0 0002    | 40       |

0 t t + 0005  
p t f tl Eq tl f Ligt l  
f l d

LVIII

| I    | Sh Tr         |
|------|---------------|
| 1850 | d<br>0 000123 |
| 60   | 121           |
| 70   | 119           |
| 80   | 119           |
| 90   | 118           |
| 1900 | 118           |
| 1910 | 0 000117      |
| 20   | 114           |
| 30   | 111           |
| 40   | 106           |
| 50   | 99            |
| 1960 | 0 000091      |
| 70   | 82            |
| 80   | 74            |
| 90   | 66            |
| 2000 | 0 000060      |

0 t t + 0005  
A p r t f th Eq tl f Ligt l  
f l d d

# SATELLITE IV

## Tables of the Phenomena

LIX

Equation of the Reduction

Occ. Tr.

| $\gamma$ | $0^d.0$   | $0^d.5$   | $1^d.0$   | $1^d.5$   | $2^d.0$   | $2^d.5$   | $3^d.0$   | $3^d.5$  | $4^d.0$  | $4^d.5$  | $5^d.0$  | $5^d.5$   | $6^d.0$   | $6^d.5$   | $7^d.0$   | $7^d.5$   | $8^d.0$   | $8^d.5$   | $9^d.0$   |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| $\alpha$ |           |           |           |           |           |           |           |          |          |          |          |           |           |           |           |           |           |           |           |
| 0        | $\pm 17$  | $\pm 17$  | $\pm 16$  | $\pm 14$  | $\pm 12$  | $\pm 10$  | $\pm 8$   | $\pm 5$  | $\pm 1$  | $\mp 2$  | $\mp 5$  | $\mp 8$   | $\mp 11$  | $\mp 13$  | $\mp 15$  | $\mp 16$  | $\mp 17$  | $\mp 17$  | $\mp 17$  |
| 10       | $\pm 109$ | 107       | 101       | 92        | 79        | 64        | 46        | 28       | $\pm 8$  | $\mp 13$ | 34       | 51        | 69        | 84        | 95        | 103       | 109       | 109       | $\mp 106$ |
| 20       | $\pm 197$ | 193       | 182       | 166       | 144       | 116       | 84        | 49       | $\pm 13$ | $\mp 24$ | 60       | 94        | 125       | 151       | 171       | 186       | 195       | 196       | $\mp 191$ |
| 30       | $\pm 280$ | 274       | 259       | 236       | 204       | 164       | 119       | 70       | $\pm 19$ | $\mp 34$ | 85       | 134       | 178       | 214       | 244       | 265       | 278       | 279       | $\mp 271$ |
| 40       | $\pm 354$ | 347       | 328       | 298       | 258       | 208       | 151       | 88       | $\pm 23$ | $\mp 44$ | 108      | 169       | 225       | 271       | 308       | 335       | 351       | 352       | $\mp 342$ |
| 50       | $\pm 418$ | 409       | 388       | 352       | 305       | 245       | 178       | 104      | $\pm 28$ | $\mp 51$ | 127      | 200       | 265       | 321       | 365       | 397       | 415       | 416       | $\mp 410$ |
| 60       | $\pm 470$ | 460       | 435       | 395       | 343       | 275       | 199       | 116      | $\pm 31$ | $\mp 57$ | 144      | 224       | 298       | 360       | 409       | 445       | 466       | 468       | $\mp 454$ |
| 70       | $\pm 507$ | 497       | 470       | 427       | 370       | 298       | 216       | 126      | $\pm 33$ | $\mp 63$ | 155      | 243       | 322       | 388       | 443       | 483       | 503       | 505       | $\mp 490$ |
| 80       | $\pm 530$ | 519       | 492       | 446       | 387       | 311       | 226       | 132      | $\pm 35$ | $\mp 65$ | 163      | 253       | 336       | 406       | 463       | 502       | 526       | 528       | $\mp 513$ |
| 90       | $\pm 537$ | 526       | 498       | 452       | 392       | 316       | 229       | 134      | $\pm 35$ | $\mp 66$ | 164      | 257       | 341       | 412       | 469       | 509       | 533       | 535       | $\mp 520$ |
| 100      | $\pm 528$ | 517       | 490       | 445       | 386       | 311       | 225       | 131      | $\pm 34$ | $\mp 65$ | 161      | 252       | 336       | 404       | 461       | 502       | 524       | 526       | $\mp 511$ |
| 110      | $\pm 504$ | 494       | 467       | 425       | 368       | 295       | 215       | 125      | $\pm 33$ | $\mp 62$ | 155      | 241       | 319       | 387       | 440       | 477       | 500       | 502       | $\mp 487$ |
| 120      | $\pm 464$ | 455       | 431       | 392       | 339       | 273       | 198       | 116      | $\pm 30$ | $\mp 57$ | 142      | 222       | 295       | 357       | 405       | 440       | 461       | 462       | $\mp 449$ |
| 130      | $\pm 412$ | 403       | 382       | 347       | 301       | 242       | 176       | 103      | $\pm 27$ | $\mp 50$ | 126      | 197       | 262       | 316       | 360       | 390       | 409       | 410       | $\mp 399$ |
| 140      | $\pm 347$ | 340       | 322       | 292       | 252       | 203       | 148       | 87       | $\pm 22$ | $\mp 42$ | 106      | 166       | 220       | 266       | 303       | 328       | 344       | 345       | $\mp 335$ |
| 150      | $\pm 272$ | 266       | 252       | 229       | 198       | 160       | 115       | 68       | $\pm 17$ | $\mp 33$ | 83       | 130       | 173       | 209       | 238       | 257       | 270       | 271       | $\mp 263$ |
| 160      | $\pm 188$ | 184       | 175       | 159       | 138       | 111       | 80        | 47       | $\pm 12$ | $\mp 24$ | 57       | 90        | 120       | 144       | 164       | 178       | 187       | 187       | $\mp 182$ |
| 170      | $\pm 98$  | 96        | 92        | 83        | 72        | 58        | 42        | 25       | $\pm 6$  | $\mp 13$ | 30       | 47        | 63        | 76        | 86        | 94        | 98        | 98        | $\mp 96$  |
| 180      | $\pm 9$   | $\pm 8$   | $\pm 8$   | $\pm 7$   | $\pm 7$   | $\pm 6$   | $\pm 4$   | $\pm 2$  | $\pm 0$  | $\mp 1$  | $\mp 3$  | $\mp 5$   | $\mp 6$   | $\mp 7$   | $\mp 8$   | $\mp 8$   | $\mp 9$   | $\mp 9$   | $\mp 8$   |
| 190      | $\mp 83$  | $\mp 82$  | $\mp 78$  | $\mp 71$  | $\mp 61$  | $\mp 48$  | $\mp 36$  | $\mp 20$ | $\mp 6$  | $\pm 10$ | $\pm 26$ | $\pm 40$  | $\pm 53$  | $\pm 64$  | $\pm 73$  | $\pm 80$  | $\pm 83$  | $\pm 83$  | $\pm 82$  |
| 200      | $\mp 173$ | 169       | 160       | 146       | 126       | 101       | 74        | 43       | $\mp 12$ | $\pm 21$ | 54       | 83        | 110       | 132       | 151       | 164       | 172       | 173       | $\pm 168$ |
| 210      | $\mp 258$ | 253       | 239       | 217       | 189       | 151       | 110       | 64       | $\mp 17$ | $\pm 32$ | 80       | 123       | 164       | 198       | 226       | 245       | 256       | 257       | $\pm 250$ |
| 220      | $\mp 335$ | 328       | 310       | 283       | 244       | 197       | 143       | 83       | $\mp 22$ | $\pm 41$ | 102      | 157       | 213       | 257       | 292       | 317       | 332       | 334       | $\pm 324$ |
| 230      | $\mp 403$ | 394       | 373       | 339       | 294       | 235       | 171       | 100      | $\mp 26$ | $\pm 50$ | 123      | 192       | 255       | 308       | 351       | 381       | 399       | 401       | $\pm 389$ |
| 240      | $\mp 457$ | 448       | 424       | 385       | 334       | 269       | 194       | 114      | $\mp 30$ | $\pm 56$ | 140      | 219       | 290       | 350       | 399       | 433       | 454       | 455       | $\pm 442$ |
| 250      | $\mp 499$ | 489       | 463       | 420       | 364       | 293       | 212       | 124      | $\mp 33$ | $\pm 61$ | 152      | 239       | 317       | 382       | 435       | 472       | 495       | 497       | $\pm 483$ |
| 260      | $\mp 526$ | 515       | 488       | 443       | 384       | 308       | 223       | 131      | $\mp 34$ | $\pm 65$ | 161      | 251       | 334       | 402       | 459       | 498       | 522       | 524       | $\pm 509$ |
| 270      | $\mp 537$ | 526       | 498       | 452       | 392       | 318       | 229       | 134      | $\mp 35$ | $\pm 66$ | 164      | 257       | 341       | 412       | 469       | 509       | 533       | 535       | $\pm 520$ |
| 280      | $\mp 532$ | 521       | 493       | 448       | 389       | 312       | 226       | 132      | $\mp 35$ | $\pm 65$ | 163      | 255       | 338       | 408       | 465       | 504       | 528       | 530       | $\pm 515$ |
| 290      | $\mp 512$ | 498       | 474       | 431       | 373       | 300       | 218       | 127      | $\mp 33$ | $\pm 63$ | 157      | 245       | 325       | 392       | 447       | 485       | 508       | 510       | $\pm 495$ |
| 300      | $\mp 476$ | 467       | 442       | 401       | 347       | 279       | 203       | 118      | $\mp 31$ | $\pm 59$ | 145      | 228       | 302       | 365       | 416       | 452       | 473       | 474       | $\pm 460$ |
| 310      | $\mp 427$ | 418       | 397       | 359       | 312       | 251       | 181       | 106      | $\mp 28$ | $\pm 52$ | 131      | 205       | 272       | 327       | 373       | 405       | 424       | 425       | $\pm 414$ |
| 320      | $\mp 365$ | 358       | 339       | 307       | 267       | 214       | 156       | 91       | $\mp 23$ | $\pm 45$ | 112      | 174       | 231       | 280       | 318       | 346       | 362       | 363       | $\pm 353$ |
| 330      | $\mp 292$ | 286       | 271       | 246       | 213       | 171       | 125       | 73       | $\mp 19$ | $\pm 36$ | 89       | 140       | 185       | 224       | 256       | 277       | 290       | 291       | $\pm 282$ |
| 340      | $\mp 211$ | 206       | 195       | 177       | 153       | 123       | 90        | 52       | $\mp 13$ | $\pm 27$ | 64       | 101       | 134       | 162       | 184       | 200       | 209       | 210       | $\pm 204$ |
| 350      | $\mp 122$ | 120       | 113       | 102       | 89        | 72        | 51        | 30       | $\mp 8$  | $\pm 15$ | 37       | 58        | 78        | 94        | 107       | 115       | 121       | 121       | $\pm 118$ |
| 360      | $\mp 31$  | $\mp 31$  | $\mp 30$  | $\mp 27$  | $\mp 23$  | $\mp 19$  | $\mp 13$  | $\mp 7$  | $\mp 2$  | $\pm 4$  | $\pm 10$ | $\pm 15$  | $\pm 20$  | $\pm 25$  | $\pm 28$  | $\pm 30$  | $\pm 31$  | $\pm 31$  | $\pm 31$  |
| 370      | $\pm 61$  | $\pm 60$  | $\pm 56$  | $\pm 49$  | $\pm 44$  | $\pm 36$  | $\pm 26$  | $\pm 15$ | $\pm 4$  | $\mp 7$  | $\mp 19$ | $\mp 29$  | $\mp 39$  | $\mp 47$  | $\mp 53$  | $\mp 58$  | $\mp 61$  | $\mp 61$  | $\mp 59$  |
| 380      | $\pm 151$ | 148       | 140       | 127       | 109       | 88        | 64        | 38       | $\pm 10$ | $\mp 18$ | 46       | 72        | 96        | 116       | 131       | 143       | 150       | 150       | $\mp 146$ |
| 390      | $\pm 237$ | 232       | 220       | 200       | 173       | 138       | 101       | 60       | $\pm 16$ | $\mp 29$ | 73       | 113       | 150       | 182       | 207       | 227       | 235       | 236       | $\mp 229$ |
| 400      | $\pm 316$ | $\pm 310$ | $\pm 293$ | $\pm 267$ | $\pm 230$ | $\pm 185$ | $\pm 134$ | $\pm 79$ | $\pm 21$ | $\mp 40$ | $\mp 96$ | $\mp 150$ | $\mp 200$ | $\mp 243$ | $\mp 276$ | $\mp 300$ | $\mp 314$ | $\mp 315$ | $\mp 306$ |

No Constant has been applied.

The unit equals  $0^s.000000$ .

The upper sign applies for Occultations, the lower for Transits.

# SATELLITE IV

## Tables of the Phenomena

LIX continued

Equation of the Reduction

Oc, Tr

| J<br>γ | 9 0 9 5 10 <sup>d</sup> 0 | 10 5 11 <sup>d</sup> 0 11 <sup>d</sup> 5 | 12 <sup>d</sup> 0 12 5 13 0 | 13 5 14 0 14 5    | 15 0 15 5 16 0    | 16 5 17 0 17 5    | 18 0  |
|--------|---------------------------|--|-----------------------------|-------------------|-------------------|-------------------|-------|
| 0      | ± 17 ± 15 ± 14            | ± 12 ± 9 ±                               | ± 4 0 ± 3                   | ± 6 ± 9 ± 11      | ± 13 ± 15 ± 17    | ± 17 ± 17 ± 16    | ± 15  |
| 10     | ± 106 99 89               | 75 58 41                                 | 21 ± 1 ± 19                 | 39 58 74          | 88 98 106         | 109 108 104       | ± 96  |
| 20     | ± 191 179 160             | 135 106 74                               | 38 ± 1 ± 35                 | 71 105 133        | 158 177 190       | 196 195 187       | ± 174 |
| 30     | ± 71 253 228              | 192 151 105                              | 54 ± ± 50                   | 1 1 148 190       | 2 4 251 71        | 279 78 67         | ± 46  |
| 40     | ± 34 3 0 87               | 243 191 13                               | 68 ± 3 ± 64                 | 127 187 41        | 94 318 34         | 35 350 337        | ± 31  |
| 50     | ± 410 378 340             | 287 25 156                               | 81 ± 3 ± 75                 | 150 2 283         | 336 376 404       | 416 413 398       | ± 368 |
| 60     | ± 454 425 381             | 322 253 175                              | 91 ± 3 ± 84                 | 169 249 318       | 376 42 454        | 467 465 447       | ± 413 |
| 70     | ± 490 459 411             | 348 274 190                              | 99 ± 4 ± 91                 | 183 69 344        | 407 455 490       | 504 50 483        | ± 446 |
| 80     | ± 513 480 430             | 364 86 198                               | 103 ± 4 ± 95                | 192 81 359        | 426 477 51        | 5 7 5 5 504       | ± 467 |
| 90     | ± 520 486 436             | 369 290 201                              | 104 ± 4 ± 97                | 194 85 364        | 431 483 519       | 534 53 511        | ± 473 |
| 100    | ± 511 478 42              | 363 285 197                              | 102 ± 4 ± 95                | 191 281 358       | 4 4 475 510       | 5 5 5 2 50        | ± 465 |
| 110    | ± 487 456 409             | 347 272 188                              | 97 ± 3 ± 92                 | 182 267 342       | 405 453 487       | 501 498 480       | ± 444 |
| 120    | ± 449 421 378             | 318 250 173                              | 90 ± 3 ± 84                 | 166 46 315        | 373 417 448       | 461 460 443       | ± 409 |
| 130    | ± 399 373 334             | 282 222 153                              | 80 ± 3 ± 74                 | 149 18 280        | 331 370 398       | 409 408 392       | ± 363 |
| 140    | ± 335 313 281             | 238 186 130                              | 67 ± 2 ± 6                  | 124 184 235       | 78 31 335         | 345 343 33        | ± 305 |
| 150    | ± 263 246 221             | 186 146 101                              | 53 ± 2 ± 49                 | 98 144 185        | 218 244 6         | 71 0 59           | ± 40  |
| 160    | ± 18 171 153              | 1 9 102 71                               | 36 ± 1 ± 34                 | 67 100 1 8        | 151 169 18        | 187 187 180       | ± 165 |
| 170    | ± 96 90 80                | 68 54 37                                 | 19 0 ± 18                   | 36 5 67           | 78 89 95          | 98 97 94          | ± 87  |
| 180    | ± 8 ± 8 ± 7               | ± 6 ± 5 ± 4                              | ± 1 0 ± 1                   | ± 3 ± 5 ± 6       | ± 7 ± 8 ± 8       | ± 9 ± 9 ± 8       | ± 8   |
| 190    | ± 82 ± 76 ± 68            | ± 57 ± 45 ± 31                           | ± 17 ± 1 ± 15               | ± 30 ± 44 ± 57    | ± 67 ± 75 ± 81    | ± 83 ± 83 ± 8     | ± 73  |
| 200    | ± 168 157 141             | 119 93 65                                | 34 ± 1 ± 31                 | 62 92 118         | 139 155 167       | 172 172 165       | ± 153 |
| 210    | ± 250 234 210             | 1 8 140 97                               | 50 ± 2 ± 46                 | 93 137 175        | 07 232 249        | 257 56 246        | ± 8   |
| 220    | ± 324 303 272             | 229 181 125                              | 65 ± 2 ± 60                 | 121 177 228       | 269 3 0 3 4       | 333 33 319        | ± 295 |
| 230    | ± 389 362 327             | 276 197 151                              | 78 ± 3 ± 73                 | 145 214 273       | 322 361 389       | 400 399 383       | ± 354 |
| 240    | ± 442 414 371             | 314 246 171                              | 88 ± 3 ± 83                 | 164 242 310       | 367 411 442       | 455 454 436       | ± 40  |
| 250    | ± 483 452 405             | 342 269 184                              | 97 ± 3 ± 90                 | 180 265 338       | 401 448 482       | 496 494 475       | ± 439 |
| 260    | ± 509 476 427             | 361 283 197                              | 102 ± 4 ± 95                | 190 279 356       | 4 2 473 508       | 523 520 500       | ± 463 |
| 270    | ± 520 486 436             | 369 90 201                               | 104 ± 4 ± 97                | 194 85 364        | 431 483 519       | 534 532 511       | ± 473 |
| 280    | ± 515 482 432             | 366 286 198                              | 103 ± 4 ± 96                | 192 83 361        | 427 479 514       | 529 527 506       | ± 469 |
| 290    | ± 495 464 416             | 351 276 191                              | 99 ± 4 ± 92                 | 185 271 349       | 411 460 495       | 509 507 487       | ± 451 |
| 300    | ± 460 431 386             | 326 257 178                              | 93 ± 3 ± 86                 | 172 253 323       | 383 428 460       | 473 471 454       | ± 42  |
| 310    | ± 414 387 347             | 294 231 159                              | 83 ± 3 ± 77                 | 153 2 7 290       | 343 384 413       | 4 5 423 407       | ± 377 |
| 320    | ± 353 330 296             | 250 197 136                              | 71 ± 2 ± 66                 | 132 194 48        | 293 328 353       | 363 361 348       | ± 3 1 |
| 330    | ± 282 264 237             | 200 158 109                              | 57 ± 2 ± 53                 | 106 155 199       | 235 263 82        | 90 289 278        | ± 58  |
| 340    | ± 04 190 171              | 144 114 79                               | 41 ± 1 ± 39                 | 76 112 143        | 169 189 204       | 209 09 201        | ± 185 |
| 350    | ± 118 111 99              | 84 66 45                                 | 23 0 ± 2                    | 44 65 83          | 98 110 118        | 121 121 116       | ± 1 8 |
| 360    | ± 31 ± 29 ± 25            | ± 22 ± 17 ± 12                           | ± 6 0 ± 6                   | ± 12 ± 16 ± 21    | ± 5 ± 28 ± 30     | ± 31 ± 31 ± 30    | ± 8   |
| 370    | ± 59 ± 55 ± 50            | ± 41 ± 33 ± 23                           | ± 12 ± 1 ± 10               | ± 22 ± 33 ± 42    | ± 49 ± 56 ± 59    | ± 61 ± 60 ± 58    | ± 53  |
| 380    | ± 146 136 122             | 103 81 54                                | 29 ± 1 ± 27                 | 54 80 102         | 121 135 146       | 150 150 144       | ± 132 |
| 390    | ± 229 215 192             | 163 128 88                               | 47 ± 2 ± 42                 | 85 126 161        | 190 213 229       | 35 234 226        | ± 209 |
| 400    | ± 306 ± 286 ± 257         | ± 217 ± 170 ± 118                        | ± 61 ± 2 ± 57               | ± 114 ± 167 ± 214 | ± 254 ± 284 ± 305 | ± 314 ± 313 ± 301 | ± 278 |

N O stant has b ppli d

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## INTRODUCTION

THE following Tables are designed for calculating the positions and phenomena of the Four Great Satellites of Jupiter between the dates 1850 and 2000. The constants upon which they are based are those derived from a discussion of eclipses observed photometrically at Harvard College Observatory from 1878 to 1903 (*Harvard Annals* vol LII parts 1 2) supplemented for the determination of two secular motions by Delambre's collection of ancient eclipses (*Mem Roy Astronom Soc* vol LIX). The expressions which are tabulated represent a theory of the motions which I hope to publish with no avoidable delay. The notation and results of this theory are rehearsed here only so far as they are necessary for understanding the tables but the reader must refer to the later publication for full details including proofs of rules laid down and derivation of all the numbers.

The inequalities of the satellites' motions and the arguments of these depend upon the masses  $m$  and upon certain coefficients  $j = (1 + m)Jb/a$  which arise from Jupiter's figure —  $J$  being the coefficient which Laplace denotes by  $\rho - \frac{1}{2}\phi$ ,  $b$  the equatorial radius of Jupiter and  $a$  the mean value of the projection of the radius vector of the  $i^{\text{th}}$  Satellite upon Jupiter's equator. I find at Jupiter's mean distance  $b = 18.927$  and with the values of  $a$  given below p. xv and the mass of Jupiter as unit

$$\begin{aligned} J &= 0.22273 \\ m &= 0.0004497 \\ m &= 2536 \\ m &= 7988 \\ m &= 4504 \end{aligned}$$

With these masses I find the period of the Libration of Satellites I II III to be  $2041^{\text{d}}.467$ . I cannot find that the libration itself reaches any sensible amount but the value of its period affects materially the distribution of the larger inequalities between the three satellites.

The co-ordinates of the satellites are referred to the centre of Jupiter as origin.

The longitudes which are given on the next page are measured from a parallel to the mean equinox of 1900 along a plane parallel to the mean ecliptic of that date up to the ascending node at  $99.4244$  of a fixed plane of inclination  $1.3098$  and thereafter along this fixed plane. This fixed plane is virtually the plane of Jupiter's instantaneous orbit of 1900 and when reference is made below to the inclination of Jupiter's equator or of a satellite's radius vector to Jupiter's orbit it is this plane which is meant. It is for the purposes of the Tables only that longitudes are reduced to this plane for the greater part of the theory they are measured along Jupiter's moving equator from a certain departure point. Denoting by  $l = nt + \epsilon$  the mean longitude so measured and by  $\pi$   $\omega$  the longitudes of the perijove and node which arise as constants of integration in the forms given to the equations of motion of the  $i^{\text{th}}$  Satellite I distinguish by brackets  $(\epsilon)$   $(\pi)$   $(\omega)$  the corresponding values to which the necessary reduction has been applied for referring them to the chosen fixed plane.

# Tables of the Four Great Satellites of Jupiter

The arguments that occur in the Tables are then combinations of the following quantities :—

| Name                                | Symbol           | Value in 1900.0 G.M.T. | Daily Tropical Motion |
|-------------------------------------|------------------|------------------------|-----------------------|
| Mean Longitude : Satellite I        | ( $\epsilon_1$ ) | 142°59987              | 203°488 992 435       |
| Satellite II                        | ( $\epsilon_2$ ) | 99°55081               | 101°374 761 672       |
| Satellite III                       | ( $\epsilon_3$ ) | 168°02628              | 50°317 646 290        |
| Satellite IV                        | ( $\epsilon_4$ ) | 234°40790              | 21°571 109 630        |
| Longitude of Perijove : Satellite I | ( $\pi_1$ )      | 265°719                | + 157 9355            |
| Satellite II                        | ( $\pi_2$ )      | 196°534                | + 047 1156            |
| Satellite III                       | ( $\pi_3$ )      | 340°679                | + 006 9513            |
| Satellite IV                        | ( $\pi_4$ )      | 283°25800              | + 001 8975            |
| Longitude of Node : Satellite I     | ( $\omega_1$ )   | 33°299                 | — 134 0305            |
| Satellite II                        | ( $\omega_2$ )   | 290°54986              | — 032 6993            |
| Satellite III                       | ( $\omega_3$ )   | 320°705                | — 006 9776            |
| Satellite IV                        | ( $\omega_4$ )   | 7°331                  | — 001 7554            |
| Longitude Node of Jupiter's Equator | $\Psi$           | 316°051                | + 000 0359            |
| Mean Anomaly of Jupiter             | G                | 225°4447               | [+ 083 0912]          |
| „ „ „ Saturn                        | G'               | 175°7586               | [+ 033 4598]          |
| „ „ „ Earth                         | G <sub>1</sub>   | 358°47                 | [+ 985 6005]          |
| Longitude of Perihelion of Jupiter  | $\Pi$            | 12°6055                | + 000 0382            |
| „ „ „ „ Earth                       | $\Pi_1$          | 101°22                 | + 000 0471            |

*Note.*—The motions of G, G', G<sub>1</sub> are enclosed in [ ] because they are not tropical motions.  $\Pi$  is the longitude of fixed point, and the motion assigned to it is merely the reflexion of the motion of the equinox. The values of  $\Pi$ , G are taken from Hill's *Tables of Jupiter*.

It will be observed that

$$\begin{aligned} n_1 - 3n_2 + 2n_3 &= 0 \\ (\epsilon_1) - 3(\epsilon_2) + 2(\epsilon_3) &= 180^\circ. \end{aligned}$$

In agreement with the notation of the theory, write

$$\begin{aligned} d_{12} &= l_1 - l_2, d_{13} = l_1 - l_3, \dots d_{10} = l_1 - G - \delta G - \Pi, \\ \text{whence } d_{12} - 2d_{23} &= 180^\circ = d_{13} - 3d_{23}; \\ g_1 &= l_1 - \pi_1, g_2 = l_1 - \pi_2, \dots \\ g'_1 &= l_2 - \pi_1, g'_2 = l_2 - \pi_2, \dots \\ g''_1 &= l_3 - \pi_1, \dots \\ g'''_1 &= l_4 - \pi_1, \dots \\ f_1 &= g_1 - 2g'_1 = 180^\circ + g'_1 - 2g''_1 = 180^\circ + f'_1, \dots \\ h_0 &= l_1 - \Psi, h_1 = l_1 - \omega_1, h_2 = l_1 - \omega_2, \\ h'_0 &= l_2 - \Psi, h'_1 = l_2 - \omega_1, h'_2 = l_2 - \omega_2, \dots \\ h''_0 &= l_3 - \Psi, \dots \\ h'''_0 &= l_4 - \Psi, \dots \\ H &= G + \delta G + \Pi - \Psi, \Lambda = \Pi - \Psi, D = G_1 + \Pi_1 - G - \delta G - \Pi, H_1 = G_1 + \Pi_1 - \Omega + 180^\circ. \end{aligned}$$

In these expressions, and below, G is supplemented by a quantity  $\delta G$ , which consists of the two chief inequalities of long period of Jupiter's mean anomaly as given in Hill's *Tables* (pp. 24, 25), namely those of arguments  $2G' - G$  and  $5G' - 2G$ .

## EQUATIONS OF LONGITUDE

The following equations are the quantities which must be added to the mean to give the true longitude of the Satellite, and include all inequalities of which I find the coefficient to

# Introduction

reach  $1'$  as well as some others the retention of which does not involve the introduction of an additional argument

SATELLITE I

| No | Argument | Notation of Tables | Coefficient of Sine | No                                     | Argument   | Notation of Tables | Coefficient of Sine |
|----|----------|--------------------|---------------------|--|--|--------------------|---------------------|
| 1  | $d$      | A                  | -0 00395            | 15                                     | $f$  | F                  | -0 00720            |
| 2  | $2d$     |                    | + 47152             | 16                                     | $f$  | G                  | + 00394             |
| 3  | $3d$     |                    | + 00158             | 17                                     | $f$  | H                  | + 00906             |
| 4  | $4d$     |                    | + 00155             | 18                                     | $f$  | I                  | + 00354             |
| 5  | $5d$     |                    | + 00012             | 19<br>20<br>21<br>22<br>23<br>24<br>25 | $G+\delta G$<br>$2(G+\delta G)$<br>$\Psi-\omega$<br>$\Psi-\omega$<br>$\Psi-\omega_3$<br>$\Psi-\omega$<br>$\omega-\omega$ | J                  | - 00155             |
| 6  | $6d$     |                    | + 00005             |  |  |                    | + 00035             |
| 7  | $7d$     |                    | + 00002             |  |  |                    | - 00074             |
| 8  | $d$      | B                  | - 00158             |  |  |                    | + 00020             |
| 9  | $2d$     |                    | + 00133             |  |  |                    | + 00077             |
| 10 | $3d$     |                    | + 00014             |  |  |                    | - 00035             |
| 11 | $4d$     |                    | + 00002             |  |  |                    | + 00096             |
| 12 | $g$      | C                  | + 00532             | 26                                     | $2h$   | K                  | - 04200             |
| 13 | $g_3$    | D                  | + 00426             | 27                                     | $h+h$  | P                  | - 00074             |
| 14 | $g_4$    | E                  | + 00190             | 28                                     | $h+h$  | Q                  | - 00028             |

SATELLITE II

| No | Arg ment | Notation of Tables | Coeffic ent of S ne | No      | Alg ment   | Notation of Tables | Coefficient of Sine                               |
|----|----------|--------------------|---------------------|---------|--|--------------------|---|
| 1  | $d$      | A                  | — 0 01182           | 19      | $2d_3 + g_3$   | K                  | + 0 00031   |
| 2  | $2d_3$   |                    | + 1 07016           | 20      | $4d - g$<br>$4d - g_3$<br>$4d - g$   | L<br>M<br>N        | — 00027   |
| 3  | $3d$     |                    | + 00480             |         |  |                    | + 00199   |
| 4  | $4d$     |                    | + 00541             |         |  |                    | + 00083   |
| 5  | $5d$     |                    | + 00038             |         |  |                    |   |
| 6  | $6d$     |                    | + 00054             |         |  |                    |   |
| 7  | $7d_3$   |                    | + 00007             | 23      | $2d$   | O                  | + 00034   |
| 8  | $d_4$    | B                  | — 00065             | 24      | $G + \delta G$<br>$2(G + \delta G)$<br>$5G - 2G + 4\delta$<br>$\pi - \pi$<br>$\Psi - \omega$<br>$\Psi - \omega_3$<br>$\Psi - \omega_4$<br>$\omega - \omega_3$<br>$\omega - \omega$ | P                  | — 01047   |
| 9  | $2d_4$   |                    | + 00045             | 25      |  |                    | — 00117   |
| 10 | $3d_4$   |                    | + 00005             | 26      |  |                    | — 00085   |
|    |          |                    | 27                  | + 00046 |  |                    |   |
|    |          |                    | 28                  | — 01265 |  |                    |   |
|    |          |                    | 29                  | — 00196 |  |                    |   |
|    |          |                    | 30                  | + 00092 |  |                    |   |
|    |          |                    | 31                  | + 00033 |  |                    |   |
|    |          |                    | 32                  | + 00056 |  |                    |   |
| 11 | $g$      | C                  | + 00092             | 33      |  |                    | $2h$<br>$h + h$<br>$h + h_3$<br>$h + h_4$<br>$2h$ |
| 12 | $g$      |                    | + 00945             | 34      | — 01265  |                    |   |
| 13 | $g_3$    |                    | + 03526             | 35      | — 00067  |                    |   |
| 14 | $g$      |                    | + 01483             | 36      | — 00016  |                    |   |
|    |          |                    | 37                  | — 00096 |  |                    |   |
| 15 | $f$      | G                  | + 01141             |         |  |                    |   |
| 16 | $f$      |                    | + 00765             |         |  |                    |   |
| 17 | $f$      |                    | — 04455             |         |  |                    |   |
| 18 | $f_4$    |                    | — 01798             |         |  |                    |   |
|    |          | H                  |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          | I                  |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          | J                  |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |
|    |          |                    |                     |         |  |                    |   |



# Tables of the Four Great Satellites of Jupiter

## SATELLITE III

| No. | Argument        | Notation of Tables | Coefficient of Sine | No. | Argument              | Notation of Tables | Coefficient of Sine |
|-----|-----------------|--------------------|---------------------|-----|-----------------------|--------------------|---------------------|
| 1   | $d_{23}$        | A                  | $-0^{\circ}06898$   | 18  | $2d_{30}-g_3''$       | H                  | $+0^{\circ}00054$   |
| 2   | $2d_{23}$       | ..                 | $-0^{\circ}00109$   | 19  | $d_{34}-g_4'''$       | I                  | $-0^{\circ}00604$   |
| 3   | $3d_{23}$       | ..                 | $-0^{\circ}00120$   | 20  | $f_1'$                | J                  | $-0^{\circ}00036$   |
| 4   | $4d_{23}$       | ..                 | $-0^{\circ}00007$   | 21  | $f_2'$                | K                  | $-0^{\circ}00332$   |
| 5   | $5d_{23}$       | ..                 | $-0^{\circ}00003$   | 22  | $f_3'$                | L                  | $+0^{\circ}00673$   |
| 6   | $6d_{23}$       | ..                 | $-0^{\circ}00004$   | 23  | $f_4'$                | M                  | $+0^{\circ}00293$   |
| 7   | $d_{34}$        | B                  | $-0^{\circ}00429$   | 24  | $G+\delta G$          | $\alpha$           | $-0^{\circ}01345$   |
| 8   | $2d_{34}$       | ..                 | $+0^{\circ}01467$   | 25  | $2(G+\delta G)$       | ..                 | $-0^{\circ}00041$   |
| 9   | $3d_{34}$       | ..                 | $+0^{\circ}00103$   | 26  | $5G'-2G+48^{\circ}.6$ | N                  | $-0^{\circ}00119$   |
| 10  | $4d_{34}$       | ..                 | $+0^{\circ}00024$   | 27  | $\pi_3-\pi_4$         | ..                 | $+0^{\circ}00069$   |
| 11  | $5d_{34}$       | ..                 | $+0^{\circ}00007$   | 28  | $\Psi-\omega_2$       | ..                 | $+0^{\circ}00044$   |
| 12  | $g_2''$         | C                  | $-0^{\circ}00030$   | 29  | $\Psi-\omega_3$       | ..                 | $-0^{\circ}00672$   |
| 13  | $g_3''$         | D                  | $+0^{\circ}17384$   | 30  | $\Psi-\omega_4$       | ..                 | $+0^{\circ}00060$   |
| 14  | $2g_3''$        | ..                 | $+0^{\circ}00017$   | 31  | $\omega_3-\omega_4$   | ..                 | $+0^{\circ}00096$   |
| 15  | $g_4''$         | E                  | $+0^{\circ}07377$   | 32  | $2h_0''$              | O                  | $-0^{\circ}03969$   |
| 16  | $2d_{23}-g_3''$ | F                  | $-0^{\circ}00078$   | 33  | $h_0''+h_2''$         | P                  | $+0^{\circ}00044$   |
| 17  | $2d_{23}-g_4''$ | G                  | $-0^{\circ}00035$   | 34  | $h_0''+h_3''$         | Q                  | $-0^{\circ}00469$   |
|     |                 |                    |                     | 35  | $h_0''+h_4''$         | R                  | $-0^{\circ}00095$   |

## SATELLITE IV

| No. | Argument        | Notation of Tables | Coefficient of Sine | No. | Argument               | Notation of Tables | Coefficient of Sine |
|-----|-----------------|--------------------|---------------------|-----|------------------------|--------------------|---------------------|
| 1   | $d_{14}$        | A                  | $+0^{\circ}00058$   | 12  | $2d_{40}-g_4'''$       | H                  | $+0^{\circ}00635$   |
| 2   | $d_{24}$        | B                  | $+0^{\circ}00051$   | 13  | $G+\delta G$           | $\alpha$           | $-0^{\circ}03216$   |
| 3   | $d_{34}$        | C                  | $-0^{\circ}00229$   | 14  | $2(G+\delta G)$        | ..                 | $-0^{\circ}00116$   |
| 4   | $2d_{34}$       | ..                 | $-0^{\circ}00115$   | 15  | $2G'-G+173^{\circ}.17$ | I                  | $+0^{\circ}00036$   |
| 5   | $3d_{34}$       | ..                 | $-0^{\circ}00025$   | 16  | $5G'-2G+48^{\circ}.64$ | ..                 | $-0^{\circ}00281$   |
| 6   | $4d_{34}$       | ..                 | $-0^{\circ}00007$   | 17  | $\Psi-\omega_3$        | ..                 | $+0^{\circ}00080$   |
| 7   | $g_3'''$        | D                  | $-0^{\circ}02079$   | 18  | $\Psi-\omega_4$        | ..                 | $-0^{\circ}00200$   |
| 8   | $g_4'''$        | E                  | $+0^{\circ}84491$   | 19  | $2h_0'''$              | J                  | $-0^{\circ}03118$   |
| 9   | $2g_4'''$       | ..                 | $+0^{\circ}00388$   | 20  | $h_0''' + h_4'''$      | K                  | $-0^{\circ}00641$   |
| 10  | $d_{34}-g_4'''$ | F                  | $+0^{\circ}00100$   | 21  | $h_0''' + h_3'''$      | L                  | $+0^{\circ}00068$   |
| 11  | $2d_{40}$       | G                  | $+0^{\circ}00119$   | 22  | $2h_4'''$              | M                  | $-0^{\circ}00030$   |

# Introduction

## RADIUS VECTOR AND VARIATION OF MOTION

With the mass of Jupiter for unity I find the following values for  $a^{3n}$  —

| Sat I     | Sat II    | Sat III   | Sat IV    |
|-----------|-----------|-----------|-----------|
| 1 0006884 | 1 0003631 | 1 0002550 | 1 000 651 |

If A N refer to Jupiter and we take

$$A N = 1048 \ 35$$

this gives for  $a$  which is the mean value of the projection of the radius upon Jupiter's equator at Jupiter's mean distance from the earth —

|         |         |         |         |
|---------|---------|---------|---------|
| 111 781 | 177 852 | 283 694 | 498 981 |
|---------|---------|---------|---------|

The mean values of the true radius vector exceed these by the amounts —

|       |       |       |       |
|-------|-------|-------|-------|
| 0 000 | 0 003 | 0 001 | 0 009 |
|-------|-------|-------|-------|

The Tables give the inequalities of the radius vector in the form — Twice the excess above unity of the ratio of its projected value on the equator to the mean value of the same With sign reversed this also measures with sufficient accuracy the variation with respect to its mean of the motion of the Satellite It is denoted in the theory by the symbol  $2\xi$  and is here referred to as the Variation

The expressions are as follows —

$$\text{Values of } 2(r/a - 1)$$

SATELLITE I

| No | Argument | Notation of Tables | Coefficient of Cosine |
|----|----------|--------------------|-----------------------|
| 1  | $d$      | A                  | +0 00004              |
| 2  | $2d$     |                    | — 00825               |
| 3  | $3d$     |                    | — 00004               |
| 4  | $4d$     |                    | — 00003               |
| 5  | $d$      | B                  | + 00002               |
| 6  | $2d$     |                    | — 00003               |
| 7  | $g$      | C                  | — 00009               |
| 8  | $g$      | D                  | — 00007               |
| 9  | $g$      | E                  | — 00003               |

SATELLITE II

| No | Argument | Notation of Tables | Coefficient of Cosine |
|----|----------|--------------------|-----------------------|
| 1  | $d_3$    | A                  | +0 00011              |
| 2  | $2d_3$   |                    | — 01886               |
| 3  | $3d_3$   |                    | — 00011               |
| 4  | $4d_3$   |                    | — 00006               |
| 5  | $g$      | D                  | — 00017               |
| 6  | $g_3$    | E                  | — 00062               |
| 7  | $g_4$    | F                  | — 00026               |

SATELLITE III

| No | Argument | Notation of Tables | Coefficient of Cosine |
|----|----------|--------------------|-----------------------|
| 1  | $d$      | A                  | +0 00127              |
| 2  | $2d$     |                    | + 00003               |
| 3  | $3d$     |                    | — 00003               |
| 4  | $d_4$    | B                  | + 00005               |
| 5  | $2d_4$   |                    | — 00028               |
| 6  | $3d_4$   |                    | — 00002               |
| 7  | $g$      | D                  | — 00303               |
| 8  | $g_4$    | E                  | — 00129               |

SATELLITE IV

| No | Argument   | Notation of Tables | Coefficient of Cosine |
|----|------------|--------------------|-----------------------|
| 1  | $d_3$      | C                  | +0 00020              |
| 2  | $2d_3$     |                    | + 00004               |
| 3  | $g_3$      | D<br>E             | + 00036               |
| 4  | $g_4$      |                    | — 01475               |
| 5  | $2g_4$     |                    | — 00005               |
| 6  | $2d_4 - g$ | H                  | — 00011               |

# Tables of the Four Great Satellites of Jupiter

## LATITUDE

The quantity tabulated below is a certain multiple of the tangent of the inclination to Jupiter's orbit of the radius vector of the Satellite. This is the quantity that is immediately required for eclipses. The multiple in question depends, among other things, upon the ellipticity of Jupiter, that is, the excess of unity above the ratio of his polar to his equatorial diameter. This quantity I take at  $1/15$ .

The multiples then become—

Sat. I  
6.26160

Sat. II  
10.01855

Sat. III  
16.00924

Sat. IV  
28.15626

and the expressions to which they lead :—

Values of  $\zeta_i$

SATELLITE I

| No. | Argument | Notation of Tables | Coefficient of Sine |
|-----|----------|--------------------|---------------------|
| 1   | $h_0$    | K                  | +0.33918            |
| 2   | $3h_0$   | ..                 | — .00012            |
| 3   | $h_1$    | L                  | + .00298            |
| 4   | $h_2$    | M                  | + .00110            |
| 5   | $h_3$    | N                  | + .00023            |
| 6   | $h_4$    | O                  | + .00006            |

SATELLITE II

| No. | Argument       | Notation of Tables | Coefficient of Sine |
|-----|----------------|--------------------|---------------------|
| 1   | $h_0'$         | Q                  | +0.54002            |
| 2   | $3h_0'$        | ..                 | — .00020            |
| 3   | $h_1'$         | Ü                  | + .08170            |
| 4   | $h_2'$         | V                  | — .00014            |
| 5   | $h_3'$         | W                  | + .00437            |
| 6   | $h_4'$         | X                  | + .00103            |
| 7   | $2d_{12}-h_2'$ | Y                  | — .00025            |
| 8   | $h_0'-2H$      | Z                  | + .00014            |
| 9   | $2h_0'-h_2'$   | } Q,               | + .00009            |
| 10  | $2h_0'+h_2'$   |                    | — .00009            |

SATELLITE III

| No. | Argument   | Notation of Tables | Coefficient of Sine |
|-----|------------|--------------------|---------------------|
| 1   | $h_0''$    | O                  | +0.84334            |
| 2   | $3h_0''$   | ..                 | — .00029            |
| 3   | $h_1''$    | S                  | — .04983            |
| 4   | $h_2''$    | T                  | — .00447            |
| 5   | $h_3''$    | U                  | + .00974            |
| 6   | $h_0''-2H$ | V                  | + .00051            |
| 7   | $h_0''+G$  | } O,               | + .00009            |
| 8   | $h_0''-G$  |                    | — .00007            |

SATELLITE IV

| No. | Argument           | Notation of Tables | Coefficient of Sine |
|-----|--------------------|--------------------|---------------------|
| 1   | $h_0'''$           | J                  | +1.31486            |
| 2   | $3h_0'''$          | ..                 | — .00036            |
| 3   | $h_0'''-2\Delta$   | ..                 | — .00108            |
| 4   | $h_1'''$           | M                  | + .13366            |
| 5   | $h_2'''$           | N                  | — .01456            |
| 6   | $h_0'''-2H$        | O                  | + .00216            |
| 7   | $h_0'''-3H+\Delta$ | P                  | + .00025            |
| 8   | $h_0''' + G$       | } Q,               | + .00030            |
| 9   | $h_0''' - G$       |                    | — .00029            |

In these expressions a rule has been adopted parallel to that for the equations of longitude : inequalities are dismissed which correspond to differences of inclination of less than one second of arc, when their recognition would require another argument. In the theory, the

## Introduction

expressions above are denoted by the symbol  $\zeta$  in the Tables below supplemented by the usual tabulation constants they are called shortly the Latitudes The inclination of Jupiter's equator to the fixed plane of his orbit which they embody is  $3^{\circ} 10' 35''$

The expressions for the Longitude Variation and Latitude are complete in themselves and may be used for finding the place of the Satellite at any given time but they require certain additional tables before they can be used for calculating the phenomena The first thing requisite is a knowledge of the time of conjunction heliocentric or geocentric superior or inferior The first tables for each Satellite which I shall next describe show approximately the times when these conjunctions occur

### MEAN CONJUNCTIONS

The synodic periods of the four Satellites I find to be

|           |     |                    |     |      |
|-----------|-----|--------------------|-----|------|
| Satellite | I   | <sup>d</sup> 1 769 | 860 | 4883 |
|           | II  | 3 554              | 094 | 1742 |
|           | III | 7 166              | 387 | 2292 |
|           | IV  | 16 753             | 552 | 3007 |

With these the times of mean superior conjunction with Jupiter may be calculated between the epochs 1850 and 2000 but it is convenient to consider simultaneously with Jupiter's mean place his chief inequalities other than the equation of the centre Those with which I reckon are the following drawn from Hill's *Tables* —

|            |                      |
|------------|----------------------|
| Table VIII | Long Period          |
| IX         | Argument III $G - G$ |
| X          | , IV $5G - 3G$       |
| XI         | V $2G - G$           |
| XII        | VI $3G - 2G$         |

these were calculated over the whole period and applied as corrections to Jupiter's mean place before the mean conjunctions were determined

Inferior mean conjunction is found from these by adding or subtracting one half the synodic period

### EQUATIONS OF TRUE CONJUNCTION

These equations consist of the various inequalities by which the time of mean conjunction may be anticipated or delayed the angular coefficient being expressed in time in proportion with the synodic motion namely at the rate for 1 of synodic motion —

|                   |                  |                  |                   |
|-------------------|------------------|------------------|-------------------|
| Sat I             | Sat II           | Sat III          | Sat IV            |
| $0^d 00' 49'' 16$ | $0^d 00' 9'' 72$ | $0^d 01' 9'' 07$ | $0^d 04' 65'' 38$ |

The inequalities are of three kinds (i) the equations of the centre of Jupiter (ii) for geocentric conjunctions Jupiter's annual parallax and (iii) the proper inequalities of the Satellite

The expression for Jupiter's equation of the centre is

$$+5.528 \sin(G + \delta G) + 0.167 \sin 2(G + \delta G)$$

I find the expression for the annual parallax

$$\begin{aligned} p = & -11.02 \sin D - 1.04 \sin 2D - 0.14 \sin 3D - 0.03 \sin 4D \\ & + \sin G (+1.06 \cos D + 0.20 \cos 2D) + \cos G (-0.55 \sin D - 0.12 \sin 2D) \\ & + \sin G (-0.38 \cos D - 0.07 \cos 2D) + \cos G (+0.19 \sin D + 0.04 \sin 2D) \end{aligned}$$

# Tables of the Four Great Satellites of Jupiter

The symbols  $G$  or  $G + \delta G$ ,  $D$ ,  $G_1$  are defined on p. xii. The symbols for them as arguments of the Tables are respectively  $\alpha$ ,  $\beta$ ,  $\gamma$ .

These two expressions are converted into time by means of the factors for synodic motion given above.

The proper inequalities of the Satellites are converted into time in the same way. They occur here with the opposite sign to that which they show as equations of longitude. Those which it is necessary to recognise are the following :—

SATELLITE I

| No. | Argument  | Notation of Tables | Coefficient of Sine    |
|-----|-----------|--------------------|------------------------|
| 1   | $2d_{12}$ | $\delta$           | $-\overset{d}{0.0023}$ |
| 2   | $2h_0$    | $\epsilon$         | $+\overset{d}{0.0002}$ |

SATELLITE II

| No. | Argument  | Notation of Tables | Coefficient of Sine    |
|-----|-----------|--------------------|------------------------|
| 1   | $2d_{23}$ | $\delta$           | $-\overset{d}{0.0106}$ |
| 2   | $2h_0$    | $\epsilon$         | $+\overset{d}{0.0004}$ |

SATELLITE III

| No. | Argument   | Notation of Tables | Coefficient of Sine    |
|-----|------------|--------------------|------------------------|
| 1   | $d_{23}''$ | $\delta$           | $+\overset{d}{0.0014}$ |
| 2   | $g_3''$    | $\epsilon$         | $-\overset{d}{0.0034}$ |
| 3   | $g_4''$    | $\zeta$            | $-\overset{d}{0.0014}$ |
| 4   | $2h_0''$   | $\eta$             | $+\overset{d}{0.0008}$ |

SATELLITE IV

| No. | Argument  | Notation of Tables | Coefficient of Sine    |
|-----|-----------|--------------------|------------------------|
| 1   | $g_4'''$  | $\delta$           | $-\overset{d}{0.0391}$ |
| 2   | $2h_0'''$ | $\epsilon$         | $+\overset{d}{0.0014}$ |

These formulæ, which are used for the first tables of each Satellite, give the time of true conjunction approximately; I shall now show how to determine the correction, or Complement, as it is called below, which is required to make it exact.

Using the approximate time just found as datum, we take out the true longitude of the Satellite upon Jupiter's orbit at this time from the Tables of Longitude, Latitude and Radius Vector.

To compare this with the place of Jupiter at the same time, we must take out the latter by help of the *Nautical Almanac*, where his heliocentric longitude for each noon is tabulated, referred to the ecliptic and mean equinox of date.\* To make this comparable with the place of the Satellite the reduction from Jupiter's orbit to the ecliptic must be applied to it with sign reversed. As the latter is not given in the *Nautical Almanac*, I have added a table for it, drawn from Hill's *Tables of Jupiter*. The excess of the longitude of Jupiter thus corrected over the longitude of the Satellite, expressed in time in proportion with the Satellite's synodic motion, with the allowance, where this is sensible, for the variation of the motion from its mean, gives the Complement which must be added to the approximate time of datum to get the exact time of superior true heliocentric conjunction upon Jupiter's orbit. This is the conjunction required for eclipses. For shadow-transits we require inferior true heliocentric conjunction; finding it approximately, as directed above, we make our comparison of the Satellite's

\* But note that before 1897 the practice was to refer it to the *true* equinox, and therefore the nutation with sign reversed must be applied to the tabulated place.

## Introduction

longitude with that of Jupiter increased or diminished by  $180^\circ$  and the complement is determined in the same way as for superior conjunction. For occultations we require superior geocentric conjunction the position of the Earth being reduced to Jupiter's orbit. That is to say the longitude of the Satellite must be found as above *plus* the annual parallax with its natural sign positive before Jupiter's opposition negative after. The annual parallax ( $p$ ) may be computed from the data of the *Nautical Almanac*\* by the formulæ

$$\sin \lambda = R \sin \lambda / \Delta$$

$$\sin p = R \sin (\odot - \psi) / \Delta \cos \lambda$$

where  $\lambda$  is Jupiter's heliocentric latitude  $R$  his radius vector and  $\Delta$  his true distance from the Earth  $R$  the radius vector of the Earth  $\odot - \psi$  the longitudes of the Sun and Jupiter in a computing office it will be taken from the calculations of the geocentric places of the planet where it arises naturally. In either case it requires a reduction from the ecliptic to Jupiter's orbit.

The formulæ employed for the two reductions to Jupiter's orbit are the following where  $\Omega$  denotes the longitude of the ascending node of Jupiter's orbit —

Reduction of Jupiter's Longitude from Ecliptic to Orbit  $+27.0 \sin 2(\psi - \Omega)$

Reduction of Annual Parallax from Ecliptic to Orbit  $+5.2 \cos D [\sin 2(\odot - \Omega) + \sin 2(\psi - \Omega)]$

These reductions are applied to the longitude of Jupiter heliocentric or geocentric before comparing it with the longitude of the Satellite to determine the complement.

For transits of the disc across the planet's face the steps are the same except that we require inferior geocentric conjunction in place of superior and must therefore compare the longitude of the Satellite with that of Jupiter increased by  $180^\circ$  in addition to the annual parallax.

Having thus found the true time of conjunction the true time of the beginning or ending of any defined phase of one of the phenomena of eclipse occultation shadow transit or disc transit is obtained by applying to it two further equations the so named Reduction to Middle and Semiduration the former of which is applied with its natural sign while the latter has a negative or a positive sign according as we seek to find ingress or egress.

### REDUCTIONS TO MIDDLE OF ECLIPSE OR OTHER PHENOMENON

I find the following as the expressions which must be applied to true time of conjunction upon Jupiter's orbit to reduce to the middle of the phenomenon —

#### SATELLITE I

| No | Argument        | Notation of Table | Eclipse     | Occultation | Shadow      | Transit     |
|----|-----------------|-------------------|-------------|-------------|-------------|-------------|
| 1  | $\sin 2h$       | K                 | $-0.000399$ | $-0.000399$ | $-0.000525$ | $-0.000525$ |
| 2  | $\sin (h + h')$ | P                 | $-0.000007$ | $-0.000007$ | $-0.000009$ | $-0.000009$ |
| 3  | $\sin (h - h')$ | Q                 | $-0.000003$ | $-0.000003$ | $-0.000003$ | $-0.000003$ |
| 4  | $\sin 2d$       | A                 | $+0.000035$ | $+0.000035$ | $+0.000035$ | $+0.000035$ |
| 5  | $\sin H \cos h$ | $\gamma K$        |             | $-0.000065$ |             | $+0.000086$ |

\* It should be noted that the *apparent* longitude of the Sun is given not the true hence in correcting it for any fraction of a day ( $x$ ) supplement  $x$  by  $0.00577$  the equation of light.

# Tables of the Four Great Satellites of Jupiter

SATELLITE II

| No. | Argument                 | Notation of Tables | Eclipse                  | Occultation              | Shadow                   | Transit                  |
|-----|--------------------------|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1   | $\sin 2h'_0$             | Q                  | $-\overset{d}{0.000810}$ | $-\overset{d}{0.000810}$ | $-\overset{d}{0.001057}$ | $-\overset{d}{0.001057}$ |
| 2   | $\sin (h'_0 + h'_2)$     | R                  | $-\overset{d}{0.000264}$ | $-\overset{d}{0.000264}$ | $-\overset{d}{0.000301}$ | $-\overset{d}{0.000301}$ |
| 3   | $\sin (h'_0 + h'_3)$     | S                  | $-\overset{d}{0.000016}$ | $-\overset{d}{0.000016}$ | $-\overset{d}{0.000018}$ | $-\overset{d}{0.000018}$ |
| 4   | $\sin (h'_0 + h'_4)$     | T                  | $-\overset{d}{0.000004}$ | $-\overset{d}{0.000004}$ | $-\overset{d}{0.000004}$ | $-\overset{d}{0.000004}$ |
| 5   | $\sin 2h'_2$             | U                  | $-\overset{d}{0.000021}$ | $-\overset{d}{0.000021}$ | $-\overset{d}{0.000021}$ | $-\overset{d}{0.000021}$ |
| 6   | $\sin (\Psi - \omega_2)$ | P                  | $+\overset{d}{0.000019}$ | $+\overset{d}{0.000019}$ | $-\overset{d}{0.000019}$ | $-\overset{d}{0.000019}$ |
| 7   | $\sin 2d_{23}$           | A                  | $+\overset{d}{0.000061}$ | $+\overset{d}{0.000061}$ | $+\overset{d}{0.000061}$ | $+\overset{d}{0.000061}$ |
| 8   | $\sin H_x \cos h'_0$     | $\gamma, Q$        | ..                       | $-\overset{d}{0.000133}$ | ..                       | $+\overset{d}{0.000174}$ |

SATELLITE III

| No. | Argument                 | Notation of Tables | Eclipse                  | Occultation              | Shadow                   | Transit                  |
|-----|--------------------------|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1   | $\sin 2h''_0$            | O                  | $-\overset{d}{0.001567}$ | $-\overset{d}{0.001567}$ | $-\overset{d}{0.002050}$ | $-\overset{d}{0.002050}$ |
| 2   | $\sin (h''_0 + h''_2)$   | P                  | $+\overset{d}{0.000019}$ | $+\overset{d}{0.000019}$ | $+\overset{d}{0.000019}$ | $+\overset{d}{0.000019}$ |
| 3   | $\sin (h''_0 + h''_3)$   | Q                  | $-\overset{d}{0.000199}$ | $-\overset{d}{0.000199}$ | $-\overset{d}{0.000229}$ | $-\overset{d}{0.000229}$ |
| 4   | $\sin (h''_0 + h''_4)$   | R                  | $-\overset{d}{0.000039}$ | $-\overset{d}{0.000039}$ | $-\overset{d}{0.000045}$ | $-\overset{d}{0.000045}$ |
| 5   | $\sin 2h''_3$            | S                  | $-\overset{d}{0.000008}$ | $-\overset{d}{0.000008}$ | $-\overset{d}{0.000008}$ | $-\overset{d}{0.000008}$ |
| 6   | $\sin (\Psi - \omega_3)$ | N                  | $+\overset{d}{0.000016}$ | $+\overset{d}{0.000016}$ | $-\overset{d}{0.000016}$ | $-\overset{d}{0.000016}$ |
| 7   | $\sin (\Psi - \omega_4)$ | ..                 | $+\overset{d}{0.000003}$ | $+\overset{d}{0.000003}$ | $-\overset{d}{0.000003}$ | $-\overset{d}{0.000003}$ |
| 8   | $\sin g''_3$             | D                  | $+\overset{d}{0.000008}$ | $+\overset{d}{0.000008}$ | $+\overset{d}{0.000008}$ | $+\overset{d}{0.000008}$ |
| 9   | $\sin H_x \cos h''_0$    | O, $\gamma$        | ..                       | $-\overset{d}{0.000264}$ | ..                       | $+\overset{d}{0.000345}$ |

SATELLITE IV

| No. | Argument                 | Notation of Tables | Eclipse                  | Occultation              | Shadow                   | Transit                  |
|-----|--------------------------|--------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1   | $\sin 2h'''_0$           | J                  | $-\overset{d}{0.002834}$ | $-\overset{d}{0.002834}$ | $-\overset{d}{0.003832}$ | $-\overset{d}{0.003832}$ |
| 2   | $\sin (h'''_0 + h'''_2)$ | L                  | $+\overset{d}{0.000068}$ | $+\overset{d}{0.000068}$ | $+\overset{d}{0.000080}$ | $+\overset{d}{0.000080}$ |
| 3   | $\sin (h'''_0 + h'''_3)$ | K                  | $-\overset{d}{0.000627}$ | $-\overset{d}{0.000627}$ | $-\overset{d}{0.000728}$ | $-\overset{d}{0.000728}$ |
| 4   | $\sin 2h'''_4$           | M                  | $-\overset{d}{0.000035}$ | $-\overset{d}{0.000035}$ | $-\overset{d}{0.000035}$ | $-\overset{d}{0.000035}$ |
| 5   | $\sin (\Psi - \omega_4)$ | I                  | $+\overset{d}{0.000050}$ | $+\overset{d}{0.000050}$ | $-\overset{d}{0.000050}$ | $-\overset{d}{0.000050}$ |
| 6   | $\sin (\Psi - \omega_3)$ | ..                 | $-\overset{d}{0.000006}$ | $-\overset{d}{0.000006}$ | $+\overset{d}{0.000006}$ | $+\overset{d}{0.000006}$ |
| 7   | $\sin g'''_4$            | E                  | $+\overset{d}{0.000028}$ | $+\overset{d}{0.000028}$ | $+\overset{d}{0.000028}$ | $+\overset{d}{0.000028}$ |
| 8   | $\sin H_x \cos h'''_0$   | J, $\gamma$        | ..                       | $-\overset{d}{0.000537}$ | ..                       | $+\overset{d}{0.000726}$ |

The last line but one of each of these expressions is not strictly due to the geometrical reduction to middle, but arises from acceleration of the Satellite's motion between conjunction and commencement of the phenomenon.

In the tabulation of these expressions the terms of the equation of light marked (1) on p. xxiv have been included.

# Introduction

## SEMIDURATION OF ECLIPSE OR OTHER PHENOMENON

I find for the value of the semidiameter of Jupiter at mean distance 18'' 927 and consistently with this and with the values of the radii on p xv the values of the coefficient of the chief term of the semidurations of the phenomena are —

|                       | Sat I                 | Sat II                | Sat III               | Sat IV                |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Eclipses Occultations | 0 <sup>d</sup> 047957 | 0 <sup>1</sup> 060367 | 0 <sup>d</sup> 076262 | 0 <sup>1</sup> 101421 |
| Shadows Transits      | 0 <sup>d</sup> 047904 | 0 <sup>d</sup> 060262 | 0 <sup>1</sup> 076052 | 0 <sup>d</sup> 100932 |

These values are measured from the moment when the centre of the Satellite is in line with the rim of Jupiter and the centre of the Sun or the Earth as the case may be

The chief variable argument of the semidurations is the quantity  $\zeta$  For eclipses  $\zeta$  is given by the formulæ of p xvi For occultations this is supplemented by a term representing the joventric latitude of the Earth Taking the inclination of the plane of Jupiter's orbit at 1 3098 and calling  $\Omega$  the longitude of its instantaneous ascending node upon the ecliptic I find for this term the following coefficients multiplied into  $R_1 \sin (\odot - \Omega) / \Delta$  where  $R_1$  is the geocentric distance of the Sun and  $\Delta$  the geocentric distance of Jupiter —

|   | Sat I  | Sat II | Sat III | Sat IV |
|---|--------|--------|---------|--------|
| $R \sin (\odot - \Omega) / \Delta \times$ | 143127 | 2 9003 | 365938  | 643593 |

This is to be applied to  $\zeta$  as an additional equation with its natural sign For shadow transit the formula for eclipse must be used but with all the coefficients increased in the ratios —

| Sat I   | Sat II  | Sat III | Sat IV  |
|---------|---------|---------|---------|
| 1 00109 | 1 00173 | 1 00275 | 1 00485 |

For transits of the disc the additional equation used for occultations must be applied but with the reversed sign and all the coefficients must be increased as for shadows in the ratios given above

The meaning of  $\zeta$  being thus defined and  $2\xi$  denoting the Variation as given on p xv I find for the semidurations —

### SATELLITE I

| <i>Eclipse</i>  | <i>Occultation</i>                |
|---|-----------------------------------|
| (1) 0 <sup>d</sup> 047957 (1- $\zeta$ ) <sup>1</sup>                      | The same as for Eclipse           |
| (2) +0 023782 $\times 2\xi$ (1-2 029 $\zeta$ ) (1- $\zeta$ ) <sup>1</sup> | together with the term            |
| (3) +0 000003 cos G   | (5) +0 <sup>d</sup> 000005 cos D  |
| (4) +0 000002 sin 2 $h$ +0 <sup>d</sup> 000002 sin <sup>4</sup> $h$       |                                   |
| <i>Shadow</i>   | <i>Transit</i>                    |
| (6) 0 <sup>1</sup> 047904 (1- $\zeta$ ) <sup>1</sup>                      | The same as for Shadow            |
| (7) +0 023756 $\times 2\xi$ (1-2 029 $\zeta$ ) (1- $\zeta$ ) <sup>1</sup> | together with the term            |
| (8) -0 000042 cos $h$ (1- $\zeta$ ) <sup>1</sup>                          | (10) -0 <sup>d</sup> 000005 cos D |
| (9) +0 000002 sin 2 $h$ +0 000002 sin <sup>4</sup> $h$                    |                                   |

### SATELLITE II

| <i>Eclipse</i>   | <i>Occultation</i>  |
|--|---|
| (1) 0 <sup>d</sup> 060367 (1- $\zeta$ ) <sup>1</sup>   | The same as for Eclipse                                     |
| (2) +0 030145 $\times 2\xi$ (1-2 011 $\zeta$ ) (1- $\zeta$ ) <sup>1</sup>                                  | together with the term                                      |
| (3) +0 000007 cos G  | (6) +0 <sup>d</sup> 000010 cos D (1- $\zeta$ ) <sup>1</sup> |
| (4) [+0 000005 sin 2 $h$ +0 000004 sin $h$ ] $\times$ (1- $\zeta$ ) <sup>1</sup>                           |   |
| (5) [+0 000004 sin 2 $h$ sin ( $h$ + $h$ ) +0 000003 sin $h$ sin $h$ ] $\times$ (1- $\zeta$ ) <sup>1</sup> |   |



# Tables of the Four Great Satellites of Jupiter

## SATELLITE II—continued

|      | Shadow   | Transit  |
|------|--|--|
| (7)  | $0.060262 (1 - \zeta_2^2)^{\frac{1}{2}}$   | The same as for Shadow                                 |
| (8)  | $+0.030092 \times 2\xi_2 (1 - 2.011 \zeta_2^2)(1 - \zeta_2^2)^{-\frac{1}{2}}$                                      | together with the term                                 |
| (9)  | $-0.000052 \cos^2 h_0' - 0.000008 \cos h_0' \cos h_2' \times (1 - \zeta_2^2)^{\frac{1}{2}}$                        | (12) $-0.000010 \cos D (1 - \zeta_2^2)^{-\frac{1}{2}}$ |
| (10) | $[+0.000005 \sin^2 2h_0' + 0.000004 \sin^4 h_0'] \times (1 - \zeta_2^2)^{-\frac{1}{2}}$                            |  |
| (11) | $[+0.000004 \sin 2h_0' \sin (h_0' + h_2') + 0.000003 \sin^3 h_0' \sin h_2'] \times (1 - \zeta_2^2)^{-\frac{1}{2}}$ |  |

## SATELLITE III

|      | Eclipse   | Occultation  |
|------|---|--|
| (1)  | $0.076262 (1 - \zeta_3^2)^{\frac{1}{2}}$  | The same as for Eclipse                                |
| (2)  | $+0.038253 \times 2\xi_3 (1 - 2.004 \zeta_3^2)(1 - \zeta_3^2)^{-\frac{1}{2}}$   | together with the term                                 |
| (3)  | $+0.000017 \cos G$  | (6) $+0.000020 \cos D (1 - \zeta_3^2)^{-\frac{1}{2}}$  |
| (4)  | $[+0.000016 \sin^2 2h_0'' + 0.000015 \sin^4 h_0''] \times (1 - \zeta_3^2)^{-\frac{1}{2}}$                               |  |
| (5)  | $[+0.000005 \sin 2h_0'' \sin (h_0'' + h_3'') + 0.000005 \sin^3 h_0'' \sin h_3''] \times (1 - \zeta_3^2)^{-\frac{1}{2}}$ |  |
|      | Shadow  | Transit  |
| (7)  | $0.076052 (1 - \zeta_3^2)^{\frac{1}{2}}$  | The same as for Shadow                                 |
| (8)  | $+0.038148 \times 2\xi_3 (1 - 2.004 \zeta_3^2)(1 - \zeta_3^2)^{-\frac{1}{2}}$   | together with the term                                 |
| (9)  | $-0.000064 \cos^2 h_0'' - 0.000004 \cos h_0'' \cos h_3'' \times (1 - \zeta_3^2)^{\frac{1}{2}}$                          | (12) $-0.000020 \cos D (1 - \zeta_3^2)^{-\frac{1}{2}}$ |
| (10) | $+0.000016 \sin^2 2h_0'' + 0.000015 \sin^4 h_0'' \times (1 - \zeta_3^2)^{-\frac{1}{2}}$                                 |  |
| (11) | $[+0.000005 \sin 2h_0'' \sin (h_0'' + h_3'') + 0.000005 \sin^3 h_0'' \sin h_3''] \times (1 - \zeta_3^2)^{-\frac{1}{2}}$ |  |

When  $\zeta_3$  exceeds .55, I write  $\{1 - (\zeta_3 + \delta\zeta_3)^2\}^{\frac{1}{2}}$  in the terms (1), (7), and omit the terms (2), (8),  $\delta\zeta_3$  being determined by

$$(13) \quad \delta\zeta_3 = +\xi_3 (-1.003 + 2.001 \zeta_3^2) / \zeta_3$$

## SATELLITE IV

|      | Eclipse  | Occultation  |
|------|--|--|
| (1)  | $0.101421 (1 - \zeta_4^2)^{\frac{1}{2}}$   | The same as for Eclipse                                |
| (2)  | $+0.051200 \times 2\xi_4 (1 - 2.001 \zeta_4^2)(1 - \zeta_4^2)^{-\frac{1}{2}}$  | together with the term                                 |
| (3)  | $+0.000050 \cos G$   | (6) $+0.000047 \cos D (1 - \zeta_4^2)^{-\frac{1}{2}}$  |
| (4)  | $[+0.000039 \sin^2 2h_0''' + 0.000040 \sin^4 h_0'''] \times (1 - \zeta_4^2)^{-\frac{1}{2}}$                                  |  |
| (5)  | $[+0.000017 \sin 2h_0''' \sin (h_0''' + h_4''') + 0.000016 \sin^3 h_0''' \sin h_4'''] \times (1 - \zeta_4^2)^{-\frac{1}{2}}$ |  |
|      | Shadow   | Transit  |
| (7)  | $0.100932 (1 - \zeta_4^2)^{\frac{1}{2}}$   | The same as for Shadow                                 |
| (8)  | $+0.050960 \times 2\xi_4 (1 - 2.001 \zeta_4^2)(1 - \zeta_4^2)^{-\frac{1}{2}}$  | together with the term                                 |
| (9)  | $[-0.000076 \cos^2 h_0''' - 0.000007 \cos h_0''' \cos h_4'''] \times (1 - \zeta_4^2)^{\frac{1}{2}}$                          | (12) $-0.000047 \cos D (1 - \zeta_4^2)^{-\frac{1}{2}}$ |
| (10) | $[+0.000039 \sin^2 2h_0''' + 0.000040 \sin^4 h_0'''] \times (1 - \zeta_4^2)^{-\frac{1}{2}}$                                  |  |
| (11) | $[+0.000017 \sin 2h_0''' \sin (h_0''' + h_4''') + 0.000016 \sin^3 h_0''' \sin h_4'''] \times (1 - \zeta_4^2)^{-\frac{1}{2}}$ |  |

When  $\zeta_4$  exceeds 0.55, I reject the terms (2), (8) and also (4), (5), (9), (10), (11), and write  $(\zeta_4 + \delta\zeta_4)^2$  in place of  $\zeta_4^2$  in (1), (7), where

$$(13) \quad \delta\zeta_4 = \xi_4 (-1.0096 + 2.0004 \zeta_4^2) / \zeta_4 + \xi_4^2 (4\zeta_4 - \frac{1}{2}\zeta_4^{-3})$$

$$(14) \quad +[-.00039 \sin^2 2h_0''' - .00040 \sin^4 h_0''' - .00017 \sin 2h_0''' \sin (h_0''' + h_4''') - .00016 \sin^3 h_0''' \sin h_4'''] / \zeta_4$$

$$(15) \quad +[+.00038 \cos^2 h_0''' + .00004 \cos h_0''' \cos h_4'''] (1 - \zeta_4^2) / \zeta_4$$

the last applying for Shadows and Transits only.

# Introduction

## PHASE OF JUPITER

The phase of Jupiter affects the phenomena of transit whether of the shadow or the disc cutting off either the beginning or the end. When the annual parallax is positive that is to say when the geocentric longitude exceeds the heliocentric the ingress of the shadow is delayed and the egress of the disc is anticipated. When the annual parallax is negative the egress of the shadow is anticipated and the ingress of the disc is delayed \*. We have a new diminished Semiduration and Reduction to Middle applicable to the phase affected the other phase following the formulæ already exposed.

I find the following allowances add to the semiduration an equation with argument  $\tan p / \tan 11$  where  $p$  is the annual parallax and with coefficient

|                          | Sat I                  | Sat II                 | Sat III                | Sat IV |
|--------------------------|------------------------|------------------------|------------------------|--------|
| Equation of Semiduration | +0 <sup>d</sup> 000017 | +0 <sup>1</sup> 000008 | +0 <sup>d</sup> 000004 |        |

and diminish the calculated values of Semiduration and Reduction to Middle by the following fractions of themselves —

|             | Semiduration                       | Reduction to Middle |
|-------------|------------------------------------|---------------------|
| Satellite I | $1 - \cos p + 0.148 \cos p \sin p$ | $\tan p$            |
| II          | $1 - \cos p + 0.057 \cos p \sin p$ | $\tan p$            |
| III         | $1 - \cos p + 0.02 \cos p \sin p$  | $\tan p$            |
| IV          | $1 - \cos p + 0.007 \cos p \sin p$ | $\tan p$            |

## PROGRESS OF AN ECLIPSE

An eclipse takes place gradually and the time shown by the several equations already considered indicates only a single definite phase of it namely the point at which the centre of the Satellite's disc is in line with the rim of Jupiter and the centre of the Sun's disc. If the albedo of the Satellite is symmetrical about its centre the brightness of it as a whole is then diminished by one half or its magnitude has risen by 0<sup>m</sup> 75. The light curve which it follows on either side of this point during the progress of eclipse depends among other factors upon the diameter of the disc. The diameters which I find to correspond with the actual light curves of the eclipses used as material for these Tables are the following at Jupiter's mean distance —

|                  | Sat I | Sat II | Sat III | Sat IV |
|------------------|-------|--------|---------|--------|
| Diameter of Disc | 0.900 | 0.796  | 1.397   | 1.341  |

The standard light curves which correspond to these show the relation between magnitude and a definite configuration defined by the fraction or multiple of the Sun's radius which is cut off by a line from the Satellite's centre touching Jupiter's rim. This fraction denoted by  $k$  is zero at half brightness negative at full brightness and positive in full eclipse †. The speed with which this standard light curve is described varies with the arguments of the Satellite's position and I find for the varying factor—

$$\pm(1 - 2\xi - \zeta)^{1/2} / (1 + 0.644 \zeta)$$

multiplied by the following coefficients which express the motion in  $k$  for one second of time

|                               | Sat I  | Sat II | Sat III | Sat IV |
|-------------------------------|--------|--------|---------|--------|
| Motions in $k$ for one second | 0.4587 | 0.2285 | 0.1134  | 0.0486 |

The sign is positive for disappearances and negative for reappearances

\* At the limb of Jupiter the shadow unaffected by phase will appear elongated in the direction of Jupiter's orbit but when affected by phase it will be foreshortened in the same direction.

† Disappearance as defined by Laplace corresponds to the phase  $k = 1$

# Tables of the Four Great Satellites of Jupiter

This motion strictly applies to the moment of half-brightness only, and is subject to acceleration for other phases. The acceleration is insensible for Satellites I, II; for Satellites III, IV it has been taken from the formulæ

$$k - t \Delta k_0 = \begin{array}{cc} \text{Sat. III} & \text{Sat. IV} \\ -\cdot 0067 & -\cdot 0125 \end{array} \times (t \Delta k_0)^2 / (1 - \zeta_i^2).$$

But as we do not explicitly meet with the co-ordinate  $k$ , but only a light-curve involving magnitude and time, I have tabulated for these two Satellites not the single curve which shows the relation between the configuration  $k$  and the magnitude  $m$ , but a succession of curves showing for different values of  $\zeta_i$  the relation of  $m$  and a quantity proportional to the time, viz.  $t \Delta k_0$ , which I call  $(k)_0$ ; here  $t$  is the number of seconds elapsed since half-brightness and  $\Delta k_0$  is the motion in  $k$  per second at that instant, as given by the formulæ on p. xxiii.

## THE EQUATION OF LIGHT

We have now shown how to calculate the true time of each phenomenon. It remains to show how to find the apparent time by applying the Equation of Light.

With solar parallax  $8''\cdot 800$ , the time taken by light to traverse unit distance is  $498^s\cdot 565 = 0^d\cdot 0057704$ , and if we take out from the *Nautical Almanac* the logarithm of the true geocentric distance of Jupiter at the time of approximate conjunction, we derive immediately the chief part of the equation. It is subject to the following corrections:—(1) in eclipses and occultations it is increased, and in shadows and transits diminished, by the constant time taken to describe the radius vector of the Satellite's orbit; this has the following values:—

| Sat. I            | Sat. II           | Sat. III          | Sat. IV             |
|-------------------|-------------------|-------------------|---------------------|
| $0^d\cdot 000016$ | $0^d\cdot 000026$ | $0^d\cdot 000041$ | $0^d\cdot 000072$ . |

(2) during the passage of light across Jupiter's orbit the position of the Earth has changed, diminishing the distance before Jupiter's opposition and increasing it after by an amount  $+ 0^d\cdot 000003 \sin D$ , which is the same for all the satellites; (3) the actual moment when the distance from Jupiter to the Earth is wanted, is not the time of conjunction, but the same diminished or increased by the semiduration; the effect of recognising this is the same as increasing the semiduration by a fraction of itself equal to  $\cdot 000091 \sin D$ , which may be taken at the following values:—

| Sat. I  | Sat. II   | Sat. III  | Sat. IV   |
|---|---|---|---|
| Coefficient of $\sin D$ : $+ 0^d\cdot 000004$ | $+ 0^d\cdot 000005 (1 - \zeta_2^2)^{\frac{1}{2}}$ | $+ 0^d\cdot 000007 (1 - \zeta_3^2)^{\frac{1}{2}}$ | $+ 0^d\cdot 000009 (1 - \zeta_4^2)^{\frac{1}{2}}$ . |

The sign of this equation is the natural sign of  $\sin D$ . The first of these corrections is united with the reduction to middle for each Satellite and the third with the semiduration.

I have now explained all the formulæ upon which the calculations are based, and I shall proceed to show how these are reduced to tables.

## ARRANGEMENT OF THE TABLES

In the tables that follow, tabulation constants have been applied in the usual manner, adding such quantities to the minor equations as make them always positive and subtracting the sum of these from the main equation. The quantity so applied is noted at the foot of each table. But where an equation or group of equations is liable to be sometimes applied and sometimes not, it is necessary to treat it in a different way from those which are applied in

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every case. Such a group is illustrated by the annual parallax of Jupiter which applies for geocentric conjunction but not for heliocentric. In these cases it has not been possible to banish negative signs altogether from the tables. the minor equations *of the group* have been made positive and the sum of the constants used subtracted from the chief equation. the group must then be applied or not as a whole recognising the natural sign which it shows. When any or all of the letters E O S T are shown in prominent connection with any of the tables they indicate that phenomenon to which that table applies.

The differences employed throughout are *upon the line* and each is equal to the mean of the preceding and following interlinear differences. Where second differences are sensible they will follow the formula

$$f(a+x)=f(a)+x\Delta+\frac{1}{2}x^2\Delta$$

and the quantity shown in the second difference column is  $\frac{1}{2}\Delta^2$ . Hence the rule will be for the interval  $x$  —*Correct the first difference entry by  $x$  times the second difference entry which stands opposite to it and apply  $x$  times this corrected quantity to the chief entry*

It has often appeared convenient to give the value of the difference  $\Delta$  which corresponds to a fraction only of the interval between successive tabulations of the argument. Thus the latter interval may be say  $2^d$  but  $\Delta$  as may be seen at the head of its column will measure the change in  $1^d$ . We then ask what fraction of  $1^d$ —not of  $2^d$ —is the interval  $x$  and multiply this fraction into  $\Delta$ . In the tables where second differences appear the quantity tabulated as  $\frac{1}{2}\Delta^2$  has been modified agreeably so that the rule for their use is that which is given above unchanged. For example taking from Table XXII of Satellite I

| K                            | Equation        | $\Delta$<br><sub>d 001</sub> | $1\Delta$  |
|------------------------------|-----------------|------------------------------|------------|
| <sup>d</sup><br>0 155<br>160 | 0 03255<br>3190 | —13 5<br>12 5                | + 10<br>10 |

and noting that the comma ( ) is placed to the right of the place where the last digit of the equation would stand to take out the equation for argument 15731 multiply 2 31 into + 10 add and to  $\Delta$  giving —13 3 multiply 2 31 into —13 3 giving product —31 and the required equation is 0 03224

An attempt has been made to mitigate the waste of effort arising from our irregularly divided units by employing within the compass of the tables only the decimal of a day and the decimal of a degree. To help the conversion from hours minutes and seconds of time and minutes and seconds of arc and conversely short auxiliary tables have been added at the end (Tables CVI–CIX)

To simplify the corrections of the numerous arguments for fractions of a day the known device has been employed of tabulating the value of the argument under the form *time elapsed from its zero point* thus for example to take out the values of arguments corresponding to Apr 17<sup>d</sup> 238300 we write 238300 upon a slip and carrying it along the line where the arguments are given for Apr 17<sup>d</sup> 0 add it to each entry and write down the sum as the extract required. A disadvantage of this plan is that when the complete period of the argument is exceeded it must be deducted and it is as a rule more trouble to deduct an irregular decimal of a day than 360. It is done with least trouble by writing or printing (say in brackets) the complement of the period of each argument at the place where the argument is to stand, and adding this in or not as may be required. But to make it less

# Tables of the Four Great Satellites of Jupiter

frequently necessary, the calculation of each table is carried somewhat beyond a complete period of its argument to such a distance as the size of the page may allow.

As already explained, the tables of each Satellite fall into three portions : first, Approximate Tables, showing the times of true conjunction, and designed as a guide in computing eclipses and the other phenomena ; second, complete Tables of Longitude, Latitude and Radius Vector, giving the place of the Satellite at any specified time with all necessary accuracy ; and third, Tables of the Phenomena, showing how to derive the true time of occurrence of any of these from a known time of true conjunction upon Jupiter's orbit. Besides these tables which belong to each Satellite in particular, there are Auxiliary Tables whose use is common to all. These show the reductions of the Annual Parallax and Jupiter from the ecliptic to Jupiter's orbit, the equation of light, and the conversion of  $^h m^s$  to decimals of a day, of  $' ''$  to decimals of a degree, and conversely. I proceed to describe these different portions in detail.

## SATELLITE I

### APPROXIMATE TABLES OF CONJUNCTION

Table I.—Column 1 shows the year, leap year being indicated by \*. Column 2 shows the true date of superior heliocentric conjunction of the Satellite and Jupiter, the Satellite's place being taken at its mean, but Jupiter's place being corrected for his chief perturbations, specified above (p. xvii). Column 3 shows the further effect which these perturbations would have in anticipating or retarding conjunctions at a later part of the same year ; it must be applied to the entry of column 2. Column 4 shows under the name of argument  $\alpha$ , and in terms of days elapsed since its zero-value, the value of the angle  $G + \delta G$  defined on p. xii. Column 5 shows under the name  $\beta$  the value of the angle  $D$  defined on p. xii. Column 6, argument  $\gamma$ , gives the value of the angle  $G$ , of p. xii. Column 7, argument  $\delta$ , gives  $2d_{12}$ . Column 8, argument  $\epsilon$ , gives  $h_0$ . The values are those which belong to the times given in column 2, allowing for the application of certain tabulation constants which are specified in the margin of the table. If inferior heliocentric conjunction is wanted, the half synodic period  $0^d.8849$  must be written upon a slip and added to each entry as it is taken out. The period of each argument is given at the foot of its column.

Table II shows the days of the year occupied in any complete number of synodic revolutions. These dates refer to ordinary years ; they must be diminished in leap year by  $1^d$  after Feb. 28. Columns 3, 4, 5 give the corresponding motions of the arguments. The entries are to be added to those of Table I. The arguments  $\alpha$ ,  $\beta$ ,  $\gamma$  are now complete ;  $\delta$ ,  $\epsilon$  must be corrected further by applying to them the equation to argument  $\alpha$  (Table III), which measures the time by which conjunction is anticipated or retarded owing to Jupiter's equation of the centre, and also, when geocentric conjunction is in question, by the annual parallax from Tables IV, V, VI.

The equation of Table III represents the terms  $+5^{\circ}.528 \sin (G + \delta G) + 0^{\circ}.167 \sin 2 (G + \delta G)$ , reduced to time as explained on p. xvii, and must be applied to the entries of columns 7, 8 of Table I as well as to the time of mean conjunction taken from column 2.

Tables IV, V, VI taken together give the Annual Parallax,  $p$ . As this group of equations has not always to be applied, its natural sign remains. Tables V, VI have been rendered positive, but IV may be either positive or negative. The three must be taken as a whole and, to find geocentric conjunction for occultations and transits, must be applied to the time of mean heliocentric conjunction (col. 2) and to the arguments  $\delta$ ,  $\epsilon$  (cols. 7, 8) of Table I.  $p$  is

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wanted also as argument for phase effects upon shadows and transits (Table LI) For eclipses  $p$  and the argument  $\gamma$  are not wanted

Table IV represents the first line of the expression for  $p$  on p xvii

Table V is a table of double entry with arguments  $\beta$   $\alpha$  representing the second line of the same

Table VI is a table of double entry with arguments  $\beta$   $\gamma$  and represents the third line of the same

Tables VII VIII give equations with arguments  $\delta$   $\epsilon$  which represent the terms of Satellite I on p xviii When these are applied to the time of conjunction its correction is complete and the sum of the various entries gives approximately the time of true conjunction heliocentric or geocentric superior or inferior

## TABLES OF LONGITUDE RADIUS VECTOR AND LATITUDE

Table IX shows in column 2 the mean longitude of Satellite I at the beginning of each year less a tabulation constant 0 60000 Columns 3-19 give the corresponding values of the arguments A-Q required for correcting it and for finding the radius vector and latitude

The significance of these arguments is given on pp xiii xvi The period of each argument is given at the foot All are expressed in days except J which refers to long period inequalities for this the year is used

Table X shows the motions of the same quantities for each day of the year After Feb 28 in leap years the date in column 1 must be diminished by a unit The correction of the motion of the arguments (cols 3-16) for the fraction of a day is made on this table by writing the fraction upon a slip and adding it to the entry as it is taken out \* but for mean longitude (col 2) the correction is made by Table XI This table gives the motions of mean longitude from 0<sup>d</sup> 01 to 1<sup>d</sup> 00 and from 0<sup>d</sup> 0001 to 0<sup>d</sup> 0100 To take out from the latter the motion say for 0<sup>d</sup> 007358 we take the correction for 0<sup>d</sup> 0058 divide it by 100 and apply it to that for 0<sup>d</sup> 0073 this step may be done mentally

Tables XII-XXIV give the equations for reducing the Satellite's mean longitude to true longitude upon Jupiter's orbit The expressions included under each argument are shown above p xiii The equations must be taken out as they stand and applied to the mean longitude

Tables XXV-XXIX must be taken as a single group the first carries the sign + or - the others have all been rendered positive Together they represent the expressions of p xv which measure  $2(r/a - 1)$  or the doubled variation of the radius vector of the Satellite projected upon Jupiter's equator compared to its mean or again with sufficient accuracy the corresponding variation of the motion of the Satellite in longitude if the sign is reversed The entries of Tables XXV-XXIX must be taken out as they stand preserving the natural sign of the first Their sum is the quantity called below the Variation and appearing as an argument in Table XLIV and elsewhere

Tables XXX-XXXIV represent the expressions of p xvi with a positive constant added to each the sum of these additions being 40000 Their sum is the quantity called the Latitude below and appears again as an argument of Table XXXVII which shows the corresponding angle of the radius vector of the Satellite above Jupiter's orbit and also in Tables XL XLIV LIII for eclipses

Table XXXV is a direction for modifying the latitude as taken for Tables XXX-XXXIV

But in correcting J it must be remembered that the unit is a year and the fraction must be divided by 365 See also a remark on p xxviii relative to the correction of Arg K

# Tables of the Four Great Satellites of Jupiter

in consequence of the jovicentric latitude of the Earth, in accordance with the expressions of p. xxi. The expression follows the natural sign of  $\sin(\odot - \Omega)$  for occultations, but the reversed sign for transits. The values of  $R_1$ ,  $\Delta$  and  $\odot$  must be taken from the *Nautical Almanac*; the value of  $\Omega$  reproduced from Hill's *Tables of Jupiter*, p. 144, is shown in Table C.

Table XXXVI shows a further correction to the latitude for shadows and transits in agreement with the statements on p. xxi.

The corrections from Tables XXXV, XXXVI must be applied in the appropriate cases to the latitude derived from Tables XXX–XXXIV before the latter is used as an argument for semiduration of any phenomenon other than eclipse in Tables XL, XLI.

## TABLES OF THE PHENOMENA

The first thing required is the exact moment of true conjunction upon Jupiter's orbit, as explained upon p. xviii. The approximate time is indicated by Tables I–VIII. The true longitude of the Satellite at this moment is taken from Tables IX–XXIV. The longitude of Jupiter at the same moment, upon the ecliptic, referred to the mean equinox, is taken from the *Nautical Almanac*\*, and is corrected by applying to it the entry of Table CI, which is reproduced from Hill's *Tables of Jupiter*, p. 144. When it is a question of occultations or transits, the annual parallax upon the ecliptic must also be computed by the formulæ of p. xix, reduced to Jupiter's orbit by Tables CII, CIII, and added with its natural sign to the reduced longitude of Jupiter. The resulting angle must be converted to decimals of a degree by Table CVI, and its excess determined above the longitude of the Satellite at the same time. Tables XXXVIII, XXXIX show the equivalent of this excess in time, or the Complement which must be applied with its natural sign to derive the exact time of true conjunction from the approximate time which Tables I–VIII have indicated. Tables XXXVIII, XXXIX assume the Satellite to have its mean motion; to correct for the true motion it is only necessary to multiply the entries of these tables by the Variation as taken from Tables XXV–XXIX, but for Satellite I this correction is seldom sensible.†

Tables XL–XLIV form a group expressing the semiduration in agreement with the formulæ of p. xxi. The argument of Table XL is the latitude as derived from Tables XXX–XXXVI or such of these as are applicable. Column 2 shows the value of the main term for eclipses and occultations, numbered (1) on p. xxi; column 4 shows the correction that is to reduce it to the value (6) of p. xxi which is appropriate to shadows and transits. Table XLI gives the value of the terms (4) on the left and (8), (9) on the right. Table XLII gives the term (3); this term is sensible only for eclipses and occultations, hence the equation of this table preserves its natural sign.

Table XLIII represents the terms (5) and (10) together with a certain term properly belonging to the equation of light and due to the motion of the earth pending the semiduration of the phenomenon which is given as (3) on p. xxiv. Table XLIV is a table of double entry representing the terms (2) or (7), the difference between which is insensible. Its arguments are Latitude and Variation. This completes the group; then the sum of the equations from Tables XL–XLIV being found, it must be applied to the exact time to true conjunction with a negative sign for the ingress of the phenomenon and a positive sign for

\* At the same time the logarithm of Jupiter's true distance from the Earth is taken out for use as argument in Table CIV.

† For perfect accuracy the complement may also be applied as a correction to Argument K before the latter is used to determine the latitude.



## Introduction

egress But it must be noted that for shadows and transits one or other of these cases is first liable to a further correction for phase by Table LI as explained below

The next group of tables gives the reduction from conjunction to the middle of the duration of the phenomenon Tables XLV–L form this group Table XLV shows to left and right of the argument the values of line 1 of the expressions given on p xix With these are united constant portions of the equation of light denoted by (1) on p xxiv The natural sign of the entry must be preserved The second third and fourth lines of the same expression are given in Tables XLIX L XLVIII the entries in which have been made positive The fifth line is represented by the Tables XLVI XLVII These are alternatives and as each applies to one phenomenon only the entries appear with their natural signs they are tables of double entry with arguments  $K \gamma$  Having formed the sum of the equations of the group XLV–L so far as they apply we add it with its natural sign to the time of conjunction but it should first be corrected for the unequal motion of the Satellite by adding to it its product by the variation in the cases when this product is sensible It is also liable to correction for either ingress or egress of shadows and transits owing to phase Table LI shows the corrections that must be applied on this account both to semiduration and to reduction When the annual parallax  $p$  is positive that is before Jupiter's opposition to the Sun the corrections apply to shadow ingress and transit egress when  $p$  is negative they apply to shadow egress and transit ingress Table LI follows the formulæ of p xxiii Column 1 shows the additional equation of the semiduration to be included with those of Tables XL–XLIV Columns 3 5 show the fractions by which the semiduration and reduction that have been calculated must be diminished before applying these quantities to the time of conjunction as directed above

Tables LII LIII LIV show the light curve of eclipse in agreement with the formulæ of p xxiii Table LII gives the standard curve The observed light curve in which magnitude and time in seconds are the co ordinates may be reduced for comparison with this by entering Table LIII with latitude as argument correcting the entry from Table LIV and multiplying into the observed time the value of the motion of the standard co ordinate  $k$  per second which is thus found When the observed light curve is thus made comparable with the standard curve the correction which the observation shows to an ephemeris derived from these tables will be indicated by that value of  $k$  in the observed light curve which corresponds to  $k=0$  in the standard curve

## SATELLITE II

The tables of Satellite II follow the same general plan as those of Satellite I and their description may therefore be somewhat compressed

### APPROXIMATE TABLES OF CONJUNCTION

The description and use of these tables is identical with that given for Satellite I changing only the value of the half synodic period to  $1^d 7770$  and the arguments designated by  $\delta \epsilon$  to  $2d_3 2h$  as stated on p xviii

### TABLES OF LONGITUDE LATITUDE AND RADIUS VECTOR

These tables again follow closely the corresponding tables for Satellite I The arguments run from A to Z and their significance is shown on pp xiii xvi The long period inequalities with which is included the Annual Equation with argument  $G + \delta G$  are tabulated under the years all the others are expressed in days In Table X the correction for the fraction of a day



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is made as for Satellite I by an adding slip, except for the mean longitude, which is provided for in Table XI. The equations of longitude, arising from the various arguments, are shown in Tables XII–XXXII, of which the last five relate to the reduction to Jupiter's orbit. After the longitude comes the group of equations, XXXIII–XXXVI, which represent the expression  $2(r, \alpha, -1)$  given on p. xv. The first member of this group has a sign + or –; the others are positive. The sum of this group of equation is termed the Variation, and appears as argument in Table LVI, and elsewhere for converting mean motion into true. Tables XXXVII–XLIV represent the expressions of p. xvi, together with tabulation constants amounting in all to '70000. Their sum is termed the Latitude, and appears again as argument of Table XLVII, which shows the corresponding inclination to Jupiter's orbit of the radius vector to the Satellite. Tables XLV, XLVI show how to modify it for the purposes of occultations, shadows and transits. With or without these additions, as may be proper, it appears again as argument of Tables L, LIII, LVI for finding the semiduration of eclipse or other phenomenon, and in Table LXVIII for finding the rate of progress in the standard light-curve in eclipse. In respect to Table XLV, which allows for the jovicentric latitude of the Earth, the remarks on p. xxviii in connection with Satellite I apply unchanged.

## TABLES OF THE PHENOMENA

The plan of these tables is the same as for Satellite I; the true longitude of the Satellite having been found at the approximate time of conjunction given by Tables I–VIII, it must be compared with the true longitude of Jupiter at the same instant—heliocentric for eclipse and shadow, geocentric for occultation and transit. The computations that are necessary for this comparison are stated on p. xxviii and need not be repeated here. The excess of the longitude of Jupiter over that of the Satellite gives the complement, in angle, and Tables XLVIII, XLIX show how to convert this into time in proportion to the mean synodic motion; and the complement in time, with its natural sign, and increased by its product by the Variation (Tables XXXIII–XXXVI), in order to allow for the difference of true synodic motion from the mean, applied to the adopted approximate time of conjunction, gives the exact time. This is conjunction in longitude, upon Jupiter's orbit. We then have two groups of tables (Tables LVII–LXV) containing the terms of reduction from conjunction to the middle of the phenomenon of eclipse, or whatever it may be, and Tables L–LVI containing the semiduration or portion applicable with opposite sign according as we seek the phenomenon of ingress or egress. Taking the latter group first, we next take the Latitude as argument (Tables XXXVII–XLIV, with XLV, XLVI); it is supposed in the theory that this is taken out at the exact time of conjunction; hence for perfect accuracy, before the latitude is derived, the complement in time should be added to the values of the arguments Q–Z, which otherwise stand for the approximate time only given by Tables I–VIII. With the latitude so found we enter Table L; in this table column 2 represents line (1) of p. xxi, being the main part of the semiduration for eclipses and occultations; column 4 represents the correction required for shadows and transits in order to pass from line (1) to line (7), p. xxii. Table LI, argument  $\alpha$ , represents line (3); this term is wanting in the theory of shadows and transits, hence it appears in the tables with its natural sign and no tabulation constant. Table LII, argument  $\beta$ , represents a term of the equation of light, given on p. xxiv. Table LIII, with arguments  $\beta$  and the latitude, represents the terms (6) and (12) which apply only to occultations and transits and therefore figure here with their natural signs. Tables LIV, LV are alternative; the former applies to eclipses and occultations and represents the terms (4), (5) together; the latter applies to shadows and transits, and represents the terms (9), (10), (11). Finally, Table

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LVI of which the arguments are Latitude and Variation represents the terms (2) or (8) no distinction being made between these. The formulæ would differ from one another by little more than a unit at maximum in the sixth place of decimals or say by 0.1 and it may be remarked here that for the satisfactory working of these tables fastidious accuracy in the last decimal place is not essential and may sometimes be relaxed without loss.

The expressions for Reduction to Middle are given on p. xx. Table LVII represents No. 1 with argument  $Q$ . The tabulation constants applied to render positive the other members of the group amounting to  $0^d 000461$  are subtracted from it. A portion of the equation of light amounting to  $\pm 0^d 000026$  is also applied here. Tables LVIII–LXIII represent the expressions numbered 2, 7, 6, 3, 4, 5 respectively, number 8 which applies with different values for occultations and transits and to these phenomena only is represented by Tables LXIV–LXV which are tables of double entry with argument  $Q, \gamma$  and must be applied with their natural signs. The sum of the equations for the Reduction must be corrected by adding to it its product by the Variation.

Table LXVI contains the corrections for Jupiter's phase which apply to shadows and transits and are shown on p. xxiii. The argument is the Annual Parallax  $p$  derived from Tables IV–VI. The equation in column 1 must be added to the semiduration as found in Tables L–LVI and the sum must be diminished by applying to it its product by the factor in column 3. Similarly the reduction drawn from Tables LVII–LXV must be modified by applying to it its product by the factor in column 5. The corrected semiduration and reduction apply to the phenomenon which is affected by phase only while for the opposite phenomenon the uncorrected values apply. The progress of an eclipse is calculated from Tables LXVII–LXIX. The first gives the standard light curve corresponding to diameter  $0' 796$  in terms of magnitude and the co-ordinate  $k$ . The second gives the relation between  $k$  and time for different values of the Latitude. The third a correction to the second due to the Variation.

## SATELLITE III

The general arrangement is the same as for Satellite I to which reference may be made for details which it is needless to repeat.

### APPROXIMATE TABLES OF CONJUNCTION

The arrangement is the same as that for Satellite I save only that the arguments  $\delta, \epsilon, \zeta, \eta$  are those so named on p. xviii and replace everywhere the two arguments that figured in Satellite I and the equation of Table III must be applied as a correction to the arguments  $\beta, \gamma$  as well as to the other entries of Table I.

### TABLES OF LONGITUDE, LATITUDE AND RADIUS VECTOR

These tables also follow closely the arrangement for Satellite I. The significance of the arguments A–V of Table XI is shown on p. xiv–xvi. The long period inequalities do not include for this Satellite the annual equation with argument  $G + \delta G$ . This equation has a separate argument  $\alpha$  but it may be noted that if we are calculating one of the phenomena with the help of the Approximate Tables  $\alpha$  has already been found and then column 16 of Table XI may be passed over. The corrections of the arguments for days elapsed from the beginning of the year are shown in Table XII. For all except the mean longitude the correction for the fraction of a day is made in the same table by means of an adding slip. For the mean longitude it is made by means of Table XIII. Tables XIV–XXXII give the

# Tables of the Four Great Satellites of Jupiter

equations of longitude which are recorded on p. xiv, each supplemented by a tabulation constant which is recorded at the foot of the table. The equations of Tables XXXIII–XXXVI taken together represent the formula of p. xv which represents  $2(r_3/a_3 - 1)$ . The four equations form a group, the tabulation constants of the last three being deducted from the first, which in consequence is always negative. Their sum is the so-called Variation, which appears again as argument of Tables XLVIII, L and elsewhere for converting mean motion into true. Tables XXXVII–XLII form a group which represents the expression of p. xvi, augmented by the sum of its tabulation constants, viz. by 1.000000. Their sum is the so-called Latitude, which reappears first as the argument of Table XLV, which shows the corresponding angle above Jupiter's orbit of the radius vector to the Satellite.

Tables XLIII, XLIV show corrections to be applied to the sum of the equations of Tables XXXVII–XLII for occultations, transits and shadows. Table XLIII is used as explained on p. xxvii. The Latitude, with or without these corrections as may be proper, is then used as argument in the Tables of the Phenomena for finding the semiduration of eclipse or other phenomenon, and the rate of progress of eclipse.

## TABLES OF THE PHENOMENA

The plan of these tables is generally the same as that for Satellite I, but there are certain differences. Tables XLVI, XLVII show the time taken to describe any given angle with the mean synodic motion, and the corresponding time with the true synodic motion is found by adding to this result its product by the Variation as taken from Tables XXXIII–XXXVI—the natural sign of the Variation being regarded. They are used like the corresponding tables of Satellites I, II, as explained on pp. xxvii, xxx, for finding the exact time of true conjunction from a comparison of the longitudes of Jupiter and the Satellite at an assumed approximate time. The correction, the so-called Complement, must be added, with its natural sign retained, to the approximate time, and also, for full accuracy, to the arguments O, S before these are used to derive the Latitude which is the argument of the following tables. When the exact time of true conjunction has been found, three quantities must be applied to it: the Reduction to the Middle of the phenomenon, the Semiduration of the phenomenon, and the Equation of Light. For the last of these, see Tables CIV, CV below. The second of them is contained in the group of tables XLVIII–LV, which represent the formulæ of p. xxii, together with the term of the equation of light (3) given on p. xxiv. Table XLIX *a*, *b*, represents in column 2 the leading term (1) of p. xxii, which is converted into (7) by the entry of column 4. The second portion, XLIX *b*, the argument of which is the latitude in its lower values from 0.450 to 1.550, is corrected by Table L, with arguments Latitude and Variation, for the terms (2) or (8) of p. xxii, just as the corresponding correction is made for Satellites I, II; but for higher latitudes this method is inexact, and in place of adding an equation to the semiduration, we correct the latitude as derived from Tables XXXVII–XLIV, before using it as argument in Table XLIX *a*, by the term  $\delta\zeta_3$  which is given on p. xxii. This Correction of High Latitudes is given in Table XLVIII. This difference of method for high and low latitudes involves a difference in the tabulation constants of Tables XLIX *a* and *b*, that of the former being  $-0^d.000100$  and of the latter  $-0^d.000500$ . Table LI represents the term (3) of p. xxii. This term is present only in eclipses and occultations. Table LII represents the term of the equation of light,  $+0^d.000007 (1 - \zeta_3^2)^{\frac{1}{2}} \sin D$  given on p. xxiv. This applies to all the phenomena. The arguments are the Latitude and  $\beta$ , which represents D. With the same arguments a term, (6) and (12) of p. xxii, is present in occultations and transits only. This is

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given in Table LIII with a natural sign which must be regarded The remaining terms of p xxii (4) and (5) are given in Table LIV and (9) (10) (11) in Table LV In the case of transits and shadows there are further equations depending on Jupiter's phase described below under Table LXV The semiduration as corrected by these various equations must be added to or subtracted from the time of conjunction which has already been found according as we seek egress or ingress of the phenomenon

The next group of equations—the Reductions to Middle—are given in Tables LVI–LXIV which represent the formulæ of p xx together with the term which gives the correction (1) to the equation of light given on p xxiv This is included in Table LVI which as to its variable part represents the term (1) of p xx The sum of tabulation constants which make the remaining terms positive has been subtracted from this table and natural sign of the equation must be regarded The terms 2–5 are represented by Tables LVII–LX the terms 6–7 by Table LXII the term 8 by Table LXI and the term 9 by Tables LXIII LXIV Table LXIII applies to occultations only Table LXIV to transits only hence they are given with their natural signs The sum of the equations of the reduction from Tables LVI to LXIV must be collected by its product by the Variation and for shadows and transits by Table LXV also and the whole applied with its natural sign to the time of true conjunction already found

Table LXV gives the corrections for Jupiter's phase which are enumerated on p xxiii These apply to shadows and transits only The argument of the tables is the annual parallax of Jupiter  $p$  which is derived from the Approximate Tables IV V VI The rule which governs the application of the equations according as  $p$  is positive or negative is given at the foot of the table Column 1 of Table LXV must be applied subject to this rule directly to the semiduration drawn from Tables XLIX–LV column 3 gives a factor which multiplied into the semiduration gives a final correction to be applied to it and column 5 a corresponding factor to be multiplied into the reduction as drawn from Tables LVI–LXIV to get the correction for phase of this quantity It will be noticed that for transits only ingress or only egress is affected by phase the other phenomena following the rules already given and ignoring Table LXV The same is true of shadow transits Tables LXVI–LXVIII give the progress of an eclipse in accordance with the rules of pp xxiii xxiv With any given latitude Table LXVI gives a light curve which shows the rise of magnitude  $m$  with the progress of a quantity ( $k$ ) which is proportional to the time and which vanishes at half brightness The rate at which ( $k$ ) varies with the time is found from Table LXVII in which the argument is Latitude and Table LXVIII which corrects the last for the Variation

### SATELLITE IV

There is no material variation at any point between the arrangements of the tables of Satellites III and IV

The Approximate Tables represent the formulæ of pp xvii xviii and are to be used in the same way as for Satellite III

In the Tables of Longitude Latitude and Radius Vector pp xiv xvi give the designation of the arguments which figure in Tables IX X p xiv shows also the values of the inequalities tabulated in Tables XII–XXV The expressions on p xv show the values of the entries of Tables XXVI–XXIX which together make up the Variation or  $2(r_4/a_4 - 1)$  and p xvi shows the terms of Latitude which are given in Tables XXX–XXXVI In the first of these tables with argument  $J$  i.e.  $h'''$  the term numbered 3 on p xvi with argument  $h''' - 2\Delta$  has been included since the motion of  $2\Delta$  is so small over the period for which these tables run as to be

# Tables of the Four Great Satellites of Jupiter

here negligible. The sum of all the constants added in Tables XXX–XXXVI is 1.50000, so that the limits of eclipse,  $\zeta_4 = \pm 1$ , correspond respectively to latitudes 2.50000 and 0.50000. Table XXXVII represents the term of p. xx, applicable to occultations and transits, Table XXXVIII the correction of p. xxii for shadows and transits, and Table XXXIX the inclination of the radius vector of the Satellite to Jupiter's orbit, which corresponds to the sum of the equations given by Tables XXX–XXXVI.

In the Tables of the Phenomena which follow, Tables XL, XLI require no additional remark; they are to be used like the corresponding tables for the other Satellites. The next two tables follow the plan of the corresponding table of Satellite III, and are designed to avoid the imperfect convergence of the corrections (2), (4), (5), (8), (10), (11) of p. xxii to the semiduration as  $\zeta_4$  approaches the values + 1 or - 1. It is accomplished by omitting these terms and adding to  $\zeta_4$  a compensating correction. This method is used from  $\zeta_4 = \mp 1$  to  $\zeta_4 = \mp .55$ , *i.e.* from latitude 0.50 to 0.95, and from latitude 2.50 to 2.05. Table XLII represents the term (13) of p. xxii, with arguments Variation and Latitude; Table XLIII the terms (14), with arguments M, J, *i.e.*  $h_4'''$ ,  $h_6'''$ ; and Table XLIV the terms (14), (15) together; the former applying to eclipses and occultations only, the latter to shadows and transits. It will be noticed that the term (15) represents (9), which is not liable to any objection on the count of convergency, but as it runs with the same arguments as (10), (11) it is included in the same treatment with them, a course which presents no difficulties. The table of the main term of the semiduration which follows breaks into two portions, to correspond with the break in the treatment of  $\zeta_4$ . For latitudes between 0.50 and 0.95 and between 2.50 and 2.05, corrected by the equations of Tables XLII and XLIII or XLIV, Table XLV<sub>a</sub> gives the value of term (1) of p. xxii in column 2, and term (7) of the same page, by applying the correction of column 5. To this table no constant has been applied on account of the terms dealt with under Tables XLII–XLIV. Table XLV<sub>b</sub> is the continuation of the same table for the remaining range of latitude. It is to be used in conjunction with the tables which follow and represent the terms (2), (4), (5), (8)–(11) of p. xxii. Of these Table XLVI, with arguments Variation and Latitude, represents the term (2) or (8), which do not differ sensibly for the range of  $\zeta_4$  that occurs. This table may be considered as complementary to Table XLII, one or the other applying in every case, but XLII treating the term considered by a correction to  $\zeta_4$ , while XLVI treats it as an addition to the semiduration. Table XLVII, in the same way, is complementary to Table XLIII, and represents the terms (4), (5) of p. xxii, which apply to eclipses and occultations, while Table XLVIII, applying to shadows and transits, represents terms (9), (10), (11), which were dealt with in the other range of latitude by Table XLIV. Constants have been applied to render the equations of Tables XLVI–XLVIII positive, and their sum is of course removed from the entries of Table XLV<sub>b</sub>. Three small equations follow. Table XLIX represents the term (3) of p. xxii; this term appears only in eclipses and occultations, and so is given without added constant, and therefore with its natural sign. Table L represents the term arising from the equation of light which is given on p. xxiv, and Table LI the terms (6), (12) of p. xxii, which apply to occultations and transits only; the convergence of this last table becomes faulty at the limits of latitude, but not to a degree that can be considered important for these phenomena.

The tables which follow, LII–LX, give the Reduction to Middle for the several phenomena and represent the formulæ of p. xx. They require no special comment. To the first of them a constant portion of the equation of light has been added, in accordance with p. xxiv. Their sum will appear with a natural sign, which must be preserved, and is to be corrected by adding to it its product by the Variation.

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The corrections for Jupiter's Phase which follows—Table LXI—is used as for the other Satellites but in this case the additional equation of semiduration is insensible as shown on p xxiii

The several elements of time of true conjunction reduction to middle semiduration and equation of light having been calculated the apparent time of each phenomenon is found as for the other Satellites

The tables of the phenomena conclude with tables specifying the rate of progress of an eclipse in agreement with the formulæ of pp xxiii xxiv With any latitude Table LXII gives a light curve which shows the rise of magnitude  $m$  with the progress of ( $k$ ) which is proportional to the time its motion per second being given by Table LXIII corrected by Table LXIV

## AUXILIARY TABLES

These tables are common to all the Satellites and have been almost sufficiently described incidentally A little repetition must be tolerated

Tables C CI are derived from Hill's *Tables of Jupiter* p 144 and give the reduction of Jupiter's ecliptic longitude to his orbit The formula is given above p xix In the same place the formula is given for Tables CII CIII which show how to reduce to Jupiter's orbit annual parallax computed upon the ecliptic

Table CIV shows the main part of the equation of light tabulated with the logarithm of Jupiter's true distance from the earth at the time of conjunction as argument The minor portions of the equation are enumerated on p xxiv of these (1) and (3) have been included in Tables XLV XLIII respectively for Satellite I and the corresponding tables for the other satellites Table CV gives the value of (2) The remaining tables hardly need description Table CVI shows the conversion of ' into decimals of a degree Table CVII makes the opposite conversion Tables CVIII CIX in the same way convert decimals of a day into  $^{\circ}$  and back again

This completes the description of the tables it only remains to illustrate their use by examples

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# Tables of the Four Great Satellites of Jupiter

## EXAMPLES OF THE USE OF THE TABLES

The following examples illustrate the use of the tables for finding the longitude, latitude and radius vector of a Satellite at any given time, and also the times of ingress and egress of all the phenomena. The rate of progress of an eclipse is also calculated, as this is required for deducing from a set of photometric observations the instant of half-brightness.

In calculating the sequence of phenomena which occur in a single revolution of the Satellite—eclipse, occultation, shadow-transit, transit of disc,—the arguments may be derived from one another with only a single reference to the tables, but the equations belonging to these arguments must be taken out independently, since the periods are for the most part short and the equations go through large changes in short intervals of time, nor is it admissible to calculate, say, the eclipses, and then interpolate in some manner for the other phenomena. But it is legitimate, when a continuous sequence of eclipses, etc., is required, to calculate, say, for Satellite I every fourth eclipse only in full, and interpolate the eclipses intermediate between these, and similarly for the occultations and the other phenomena.

The tables of longitude recognise all inequalities of which I find the coefficient of longitude to amount to  $1''$  or over. This is equivalent in the times of the phenomena to the following amounts: for Satellite I  $0^s.12$ , for Satellite II  $0^s.24$ , for Satellite III  $0^s.48$ , for Satellite IV  $1^s.12$ . A rule of about the same rigour in point of time is applied to the equations which enter through the latitude. Hence while the tabulation runs for all four Satellites to  $0^d.000001$ , *i.e.*, to  $0^s.0864$ , and is correctly made up to that point for all the terms properly included, it is by no means complete to that point for Satellite IV and even for Satellite III. It may be remembered then that for these two Satellites the last digit in tables of time cannot be insisted upon, and is to be regarded merely as a guard-figure; this will facilitate interpolations, especially in the tables of double entry.

Among the accessory quantities which are found with the help of the *Nautical Almanac*, the longitude of Jupiter ( $\lambda$ ) is given as reduced to Jupiter's orbit by Table CI, and referred to the *mean* equinox; the Sun's longitude ( $\odot$ ) is its *true* place, referred to the *mean* equinox; the annual parallax ( $p$ ) is reduced to Jupiter's orbit by Tables CII, CIII.

The longitude of the Satellite which is found is referred to Jupiter's orbit; the radius vector is for Jupiter's mean distance; the angle corresponding to the latitude is above Jupiter's orbit. The complement has been added as a correction to the arguments of latitude before the latitude was taken out.

## SATELLITE I

The examples calculated are the six phenomena:—1909 June 1, *Occultation Disappearance*; June 2, *Transit Ingress, Shadow Ingress, Transit Egress, Shadow Egress*; June 3, *Eclipse Re-appearance*. Incidentally they show how to find the longitude, latitude and radius vector, since the exact values of these are required at the approximate times of conjunction.

# Introduction

## SATELLITE I—APPROXIMATE CONJUNCTIONS 1909 JUNE 1 2 3

| Superior Geoc  |   |                    | Inferior Geoc  |                    |  | Inferior Helio     |  |                    | Superior Helio   |           |           |
|--|---|--------------------|--|--------------------|--|--------------------|--|--------------------|--|-----------|-----------|
| Arguments  | Equations   | Arguments          | Equations  | Arguments          | Equations  | Arguments          | Equations  | Arguments          | Equations  | Arguments | Equations |
| I<br>II<br>(5667 4)<br>1670 5 $\alpha$<br>152 1822 7                         | IV — 0641<br>V 91<br>VI 23                                      | $\alpha$<br>1823 6 | IV — 0640<br>V 91<br>VI 23                                     | $\beta$<br>95 85   | $\beta$<br>95 85   | $\gamma$<br>151 3  | IV<br>V <i>Ibid</i><br>VI                                | $\alpha$<br>1824 5 | IV<br>V<br>VI  |           |           |
| I<br>II<br>(601 12)<br>341 64 $\beta$<br>15 21 94 97                         | $p$ — 0527  | $\beta$<br>95 85   | $p$ — 0526   | $\gamma$<br>151 3  | $\gamma$<br>151 3  | $\delta$<br>1 484  | $p$ — 0526   | $\beta$<br>96 72   | $p$  |           |           |
| I<br>II<br>(634 7)<br>363 5 $\gamma$<br>152 2 150 4                          |   | $\gamma$<br>151 3  |  | $\delta$<br>1 484  | $\delta$<br>1 484  | $\epsilon$<br>0 09 |  | $\gamma$           |  |           |           |
| I<br>II<br>III<br>$p$<br>(8 37)<br>1 760<br>613<br>42 $\delta$<br>— 53 0 599 | I 0680<br>II 1 2080<br>III 423<br>$p$ — 527<br>VII 11<br>VIII 4 | $\delta$<br>1 484  | I } 2 1609<br>II }<br>III 423<br>$p$ — 526<br>VII 49<br>VIII 5 | $\delta$<br>1 537  | I } 2 1609<br>II }<br>III 423<br>$p$<br>VII 46<br>VIII 5 | $\epsilon$<br>0 14 | I } 2 1609<br>II }<br>III 423<br>$p$<br>VII 46<br>VIII 5 | $\delta$<br>0 659  | I } 3 0458<br>II }<br>III 422<br>$p$<br>VII 14<br>VIII 5 |           |           |
| I<br>II<br>III<br>$p$<br>(8 23)<br>93<br>6<br>4 $\epsilon$<br>— 5 0 98       | June 1 2671   | $\epsilon$<br>0 09 | June 2 1560  | $\epsilon$<br>0 14 | $\epsilon$<br>0 14                                       | June 2 2083        | June 2 2083  | $\epsilon$<br>1 03 | June 3 0899  |           |           |

The numbers in ( ) are the complements of the periods of the arguments thus for argument  $\beta$  in place of subtracting  $398^1 88$  we add  $601^d 12$  when it is necessary The arguments for Inferior Geocentric Conjunction are got from those for Superior Geocentric Conjunction by adding  $0^d 8849$  to each and do not involve a fresh reference to the tables similarly those for Superior Heliocentric are derived from Inferior Heliocentric the latter are the same as for Inferior Geocentric except that in  $\delta$   $\epsilon$  the parallax  $p$  ( $-0^d 053$ ) which was applied must be removed

## ACCESSORY QUANTITIES DRAWN MAINLY FROM *Nautical Almanac*

|         |                        |             |             |             |             |
|---------|------------------------|-------------|-------------|-------------|-------------|
| Table C | $\Omega$               | 99 32 4     | 99 32 4     |             |             |
|         | $\odot$                | 70 35 30 5  | 71 26 34 1  |             |             |
|         | log R                  | 006169      | 006224      |             |             |
|         | log $\Delta$           | 733410      | 734528      |             |             |
|         | $z$                    | 166 42 24 3 | 166 46 28 6 | 166 46 43 0 | 166 50 45 3 |
|         | $p$                    | —10 44 17 9 | —10 43 35 7 |             |             |
|         | To compare<br>with Sat | 155 96844   | 156 04803   | 166 77861   | 166 84592   |
| XXXV    | $\oplus$ Jovic Lat     | — 01299     | — 01260     |             |             |



# Tables of the Four Great Satellites of Jupiter

## SATELLITE I—LONGITUDE, LATITUDE AND RADIUS VECTOR

| 1909      |                                       |  |   | June 1 <sup>st</sup> 267100  |  |  |                    | June 2 <sup>nd</sup> 156000  |   |               |  | June 2 <sup>nd</sup> 208300   |  |               |  | June 3 <sup>rd</sup> 089900 |  |            |  |
|-----------|---------------------------------------|--|---|--|--|--|--------------------|--|---|---------------|--|---|--|---------------|--|-----------------------------|--|------------|--|
| Arguments |                                       | Longitude  |   | Arguments  |  | Longitude  |                    | Arguments  |   | Longitude     |  | Arguments   |  | Longitude     |  |                             |  |            |  |
| IX<br>X   | (6.47454)<br>1.68954<br>67217 2.36171 | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | 130°31800<br>330°32685<br>52°90714<br>1°44477<br>88068<br>120<br>1089<br>706<br>63<br>1394<br>625<br>1435<br>744<br>444<br>4366<br>84<br>50 | A<br>3.25061   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | 130°31800<br>173°81584<br>30°52335<br>1°22093<br>8726<br>542<br>109<br>298<br>339<br>1400<br>621<br>1425<br>745<br>444<br>4267<br>83<br>52 | A<br>3.30291       | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | 130°31800<br>173°81584<br>40°69780<br>1°68896<br>1°4234<br>551<br>79<br>371<br>360<br>1400<br>621<br>1425<br>745<br>444<br>3296<br>76<br>61 | A<br>0°65905  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | 130°31800<br>17°30483<br>16°27912<br>2°01454<br>8095<br>327<br>1119<br>632<br>40<br>1405<br>617<br>1416<br>746<br>444<br>3338<br>77<br>61 |  |               |  |                             |  |            |  |
|           | IX<br>X                               |  |   |  |  |  |                    |  |   |               |  |   | (7.650)<br>1.102<br>1.847 0°599  | B<br>1°488    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | B<br>1°540                  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | B<br>2°422 | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV |
| IX<br>X   |                                       | (8.229)<br>0°325<br>1°773 0°327  | C<br>1°216  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | C<br>1°268   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | C<br>0°379         | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | C<br>0°379  |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (8.231)<br>0°626<br>1°885 0°742  |   |  |  |  |                    |  |   | D<br>1°631    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | D<br>1°683  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | D<br>0°796    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | D<br>0°796                  |  |            |  |
| IX<br>X   |                                       | (8.231)<br>0°990<br>1°889  | E<br>1°999  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | E<br>0°282   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | E<br>1°164         | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | E<br>1°164  |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (598.84)<br>110°31<br>152°27 262°58  |   |  |  |  |                    |  |   | F<br>263°47   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | F<br>263°52   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | F<br>264°40   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | F<br>264°40                 |  |            |  |
| IX<br>X   |                                       | (542.33)<br>32°46<br>152°27 184°73   | G<br>185°62   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | G<br>185°67  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | G<br>186°55        | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | G<br>186°55   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (517.70)<br>50°46<br>152°27 202°73   |   |  |  |  |                    |  |   | H<br>203°62   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | H<br>203°67   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | H<br>204°55   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | H<br>204°55                 |  |            |  |
| IX<br>X   |                                       | (514.41)<br>436°53<br>152°27 103°21  | I<br>104°10   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | I<br>104°15  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | I<br>105°03        | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | I<br>105°03   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | J<br>1909°417  |   |  |  |  |                    |  |   | J<br>1909°420 | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | J<br>1909°420   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | J<br>1909°422 | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | J<br>1909°422               |  |            |  |
| IX<br>X   |                                       | (8.23086)<br>85876<br>1°89039 0°98001  | K<br>-10<br>1°86891   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | K<br>+10<br>1°92121  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | K<br>+9<br>1°03367 | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | K<br>+9<br>1°03367  |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (8.232)<br>875<br>1°989  |   |  |  |  |                    |  |   | L<br>1°985    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | L<br>0°269  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | L<br>1°151    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | L<br>1°151                  |  |            |  |
| IX<br>X   |                                       | (8.231)<br>1°513<br>1°914  | M<br>0°778  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | M<br>0°830   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | M<br>1°712         | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | M<br>1°712  |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (8.23)<br>0°98<br>1°90   |   |  |  |  |                    |  |   | N<br>2°00     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | N<br>0°28   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | N<br>1°16     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | N<br>1°16                   |  |            |  |
| IX<br>X   |                                       | (8.2)<br>0°7<br>1°9  | O<br>0°9  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | O<br>0°9   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | O<br>0°0           | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | O<br>0°0  |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.116)<br>0°867<br>1°056  |   |  |  |  |                    |  |   | P<br>0°160    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | P<br>0°212  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | P<br>0°210    | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | P<br>0°210                  |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50                   |  |            |  |
| IX<br>X   |                                       | (9.12)<br>0°30<br>1°02   | Q<br>0°45   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50  | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV                           | Q<br>0°50          | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   |               |  |   |  |               |  |                             |  |            |  |
|           | IX<br>X                               | (9.12)<br>0°30<br>1°02   |   |  |  |  |                    |  |   | Q<br>0°45     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50   | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV | Q<br>0°50     | IX<br>X<br>XI {<br>XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV |                             |  |            |  |

# Introduction

SATELLITE I—PHENOMENA 1909 JUNE 1 2 3

Occult tion Dis

Transit Ing and Eg

Shadow Ing and Eg

Eclipse Re

| Semidurations                   |  |  |   |  |
|---------------------------------|--|--|---|--|
| XL                              | <sup>d</sup><br>0 047261                   | <sup>d</sup><br>0 047179                   | <sup>d</sup><br>0 046844                    | <sup>d</sup><br>0 046924                   |
| XLI                             | 45   | 9  | 15  | 46   |
| XLII                            | — 3  |  |   | — 3  |
| XLIII                           | 10   | 10   | 10  | 10   |
| XLIV                            | 354  | 144  | 118   | 384  |
|                                 | <u>0 047667</u>                            | <u>0 04734</u> Eg                          | <u>0 046987</u> Ing                         | <u>0 047361</u>                            |
| LI                              |  | 15<br>— 846<br><u>0 046511</u> Ing         | 15<br>— 840<br><u>0 046162</u> Eg           |  |
| Reductions to Middle            |  |  |   |  |
| XLV                             | — 0 000284                                 | — 0 000408                                 | — 0 000530                                  | — 0 000384                                 |
| XLVI                            | — 29                                       |  |   |  |
| XLVII                           |  | — 37                                       |   |  |
| XLVIII                          | 62   | 7  | 10  | 58   |
| XLIX                            | 4  | 4  | 3   | 3  |
| L                               | 5  | 5  | 6   | 6  |
| Var                             | — 1  | 2  | 3   | — 2  |
|                                 | <u>— 0 000243</u>                          | <u>— 0 000427</u> Eg                       | <u>— 0 000508</u> Ing                       | <u>— 0 000319</u>                          |
| LI                              |  | + 16<br><u>— 0 000411</u> Ing              | + 19<br><u>— 0 000489</u> Eg                |  |
| Apparent Times of the Phenomena |  |  |   |  |
| CIV CV                          | <sup>d</sup><br>0 031237                   | <sup>d</sup><br>0 031317                   | <sup>d</sup><br>0 031322                    |  |
| Approx                          | 1 267100                                   | 2 156000                                   | 2 208300                                    |  |
| Comp                            | — 99                                       | — 101                                      | 104   |  |
| Semidur                         | — 47667                                    | — 46511                                    | — 46987                                     |  |
| Reduction                       | — 243                                      | — 411                                      | — 508                                       |  |
|                                 | <u>— 48009</u> ←                           | <u>— 47023</u> ←                           | <u>— 47495</u> ←                            |  |
|                                 | June 1 250328                              | June 2 140294                              | June 2 192231                               |  |
| CIV CV                          |  | 0 031317                                   | 0 031322                                    | <sup>d</sup><br>0 031401                   |
| Approx                          |  | 2 156000                                   | 2 208300                                    | 3 089900                                   |
| Comp                            |  | — 101                                      | 104   | 85   |
| Semidur                         |  | 47342                                      | 46162                                       | 47361                                      |
| Reduction                       | ←  | — 427                                      | — 489                                       | — 319                                      |
|                                 |  | <u>— 528</u> ←                             | <u>— 489</u> ←                              | <u>— 319</u> ←                             |
|                                 |  | June 2 234131                              | June 2 285399                               | June 3 168428                              |
| CVIII                           | <sup>d h m</sup><br>Oc Dis June 1 6 0 28 3 | <sup>d h m</sup><br>Tr Ing June 2 3 22 1 4 | <sup>d h m</sup><br>Sh Ing June 2 4 36 48 8 | <sup>d h m</sup><br>Ecl Re June 3 4 2 32 2 |
| LIII LIV                        |  | Eg 5 37 8 9                                | Eg 6 50 58 5                                | Δt per sec — 0450                          |

# Tables of the Four Great Satellites of Jupiter

## SATELLITE II

The phenomena calculated are the following:—1892 Sep. 6, Eclipse Disappearance; Sep. 8, Shadow Ingress, Transit Ingress, Shadow Egress, Transit Egress; Sep. 10, Occultation Reappearance.

| Superior Helioc. |          |            | Inferior Helioc. |        |            | Inferior Geoc. |        |       | Superior Geoc. |        |               |
|------------------|----------|------------|------------------|--------|------------|----------------|--------|-------|----------------|--------|---------------|
| Arguments        |          |            | Equations        |        |            | Arguments      |        |       | Equations      |        |               |
| I                | (5667.4) |            | IV               | „      |            | IV             | +      | 305   | IV             | +      | 274           |
| II               | 4128.9   | $\alpha$   | V                | „      | $\alpha$   | V              |        | 241   | V              |        | 240           |
|                  | 248.8    | 4377.7     | VI               | „      | 4379.5     | VI             |        | 138   | VI             |        | 139           |
| I                | (601.12) |            | $p$              | „      |            | $p$            | +      | .0684 | $p$            | +      | .0653         |
| II               | 117.70   | $\beta$    |                  |        | $\beta$    |                |        |       |                |        |               |
|                  | 248.79   | 366.49     |                  |        | 368.27     |                |        |       |                |        |               |
| I                | (634.7)  |            |                  |        |            |                |        |       |                |        |               |
| II               | 0.5      | $\gamma$   |                  |        | $\gamma$   |                |        |       |                |        |               |
|                  | 248.8    | 249.3      |                  |        | 251.1      |                |        |       |                |        |               |
| I                | (6.475)  |            |                  |        |            |                |        |       |                |        |               |
| II               | 1.090    |            |                  |        |            |                |        |       |                |        |               |
| III              | 2.004    | $\delta$   | I                | 1.8046 | $\delta$   | I              | 3.5816 |       | I              | 3.5816 | 5.3587        |
| $p$              | .084     | 3.178      | II               | 4.7866 | 1.430      | II             | 4.7866 |       | II             | 4.7866 | 4.7866        |
|                  | ...      |            | III              | 838    |            | III            | 840    |       | III            | 840    | 841           |
| I                | (6.45)   |            | $p$              | „      |            | $p$            | +      | 684   | $p$            | +      | 653           |
| II               | 0.32     |            | VII              | 212    |            | VII            |        | 102   | VII            |        | 196           |
| III              | .20      | $\epsilon$ | VIII             | 53     | $\epsilon$ | VIII           |        | 53    | VIII           |        | 52            |
|                  | .08      |            |                  |        |            |                |        |       |                |        |               |
| $p$              | ...      | 0.60       | Sept.            | 6.7015 | 2.38       | Sept.          | 8.4666 | 2.45  | Sept.          | 8.5361 | 4.23          |
|                  |          |            |                  |        |            |                |        |       |                |        | Sept. 10.3195 |

## ACCESSORY QUANTITIES

|         |                           |                |               |                |                 |
|---------|---------------------------|----------------|---------------|----------------|-----------------|
| Table C | $\Omega$                  | 99° 22'.2      | 99° 22'.2     | 99° 22'.2      | 99° 22'.2       |
|         | $\odot$                   | „              | „             | 166° 47' 5''.9 | 168° 31' 10''.5 |
|         | log $R_i$                 | „              | „             | .002878        | .002678         |
|         | log $\Delta$              | .615489        | .613759       | .613692        | .612015         |
|         | $z$                       | 16° 37' 25''.7 | 16° 47' 8''.7 | 16° 47' 31''.6 | 16° 57' 20''.8  |
|         | $p$                       | „              | „             | +7° 2' 24''.4  | +6° 43' 28''.5  |
|         | To compare<br>with Sat. } | 16°.62380      | 16°.78575     | 23°.83222      | 23°.68036       |
| XLV     | $\oplus$ Jovic. Lat.      | „              | „             | +°.05180       | +°.05261        |

# Introduction

## SATELLITE II—LONGITUDE LATITUDE AND RADIUS VECTOR

89

S pt mb 67 5

S pt mb 84666

S pt mb 8536

S pt mb 395

| Ag t |              | L g t d |         | Ag t   |           | L g t d |         | Ag t   |           | L g t d |         | Ag t   |           | L g t d |          |
|------|--------------|---------|---------|--------|-----------|---------|---------|--------|-----------|---------|---------|--------|-----------|---------|----------|
| IX   | (949 7)      | IX      | 6 87    | IX     | 6 87      | IX      | 6 87    | IX     | 6 87      | IX      | 6 87    | IX     | 6 87      | IX      | 16 87    |
| X    | 7936 A       | X       | 43 69 4 | X      | 346 43994 | X       | 43 69 4 | X      | 346 43994 | X       | 43 69 4 | X      | 346 43994 | X       | 189 8946 |
| X    | 3 9 5 6 7 65 | XI      | 7 96 33 | XI     | 46 63 39  | XI      | 7 96 33 | XI     | 53 7 862  | XI      | 3 97    | XI     | 3 97      | XI      | 3 4 6 8  |
| IX   | (5 49)       | XII     | 5 6     | XII    | 669 7     | XII     | 5 6     | XII    | 6 8 5     | XII     | B       | XII    | B         | XII     | 963 6    |
| X    | 3 99 B       | XIII    | 46 9    | XIII   | 1 65934   | XIII    | 46 9    | XIII   | 1 5454    | XIII    | 8       | XIII   | 8         | XIII    | 6 7 4    |
| X    | 59 7         | XIV     | 64      | XIV    | 7         | XIV     | 64      | XIV    | 99        | XIV     | C       | XIV    | C         | XIV     | 4        |
| IX   | (6 44)       | XV      | 43      | XV     | 769       | XV      | 43      | XV     | 1695      | XV      | 78      | XV     | 78        | XV      | 313      |
| X    | 3 55 C       | XVI     | 6496    | XVI    | 744       | XVI     | 6496    | XVI    | 5 69      | XVI     | D       | XVI    | D         | XVI     | 67       |
| X    | 73 7         | XVII    | 964     | XVII   | 3         | XVII    | 964     | XVII   | 17 7      | XVII    | 3 09    | XVII   | 3 09      | XVII    | 9 6      |
| IX   | (6 447)      | XVIII   | 736     | XVIII  | 17 8      | XVIII   | 736     | XVIII  | 66        | XVIII   | E       | XVIII  | E         | XVIII   | 679      |
| X    | 3 D          | XIX     | 48      | XIX    | 65        | XIX     | 48      | XIX    | 895       | XIX     | L       | XIX    | L         | XIX     | 83       |
| X    | 4 3 7        | XX      | 8955    | XX     | 895       | XX      | 8955    | XX     | 3 9       | XX      | 6       | XX     | 6         | XX      | 8948     |
| IX   | (6 4486)     | XXI     | 3       | XXI    | 3 8       | XXI     | 3       | XXI    | 57        | XXI     | F       | XXI    | F         | XXI     | 3 57     |
| X    | 994 9 5445   | XXII    | 5       | XXII   | 5         | XXII    | 5       | XXII   | 379       | XXII    | 46      | XXII   | 46        | XXII    | 58       |
| IX   | (6 449)      | XXIII   | 37      | XXIII  | 9         | XXIII   | 37      | XXIII  | 8         | XXIII   | G       | XXIII  | G         | XXIII   | 6        |
| X    | 4 5 979      | XXIV    | 36      | XXIV   | 1 9       | XXIV    | 36      | XXIV   | 38        | XXIV    | 7 98    | XXIV   | 7 98      | XXIV    | 6        |
| IX   | (598 84)     | XXV     | 74      | XXV    | 355       | XXV     | 74      | XXV    | 8         | XXV     | I       | XXV    | I         | XXV     | 57       |
| X    | 319 8        | XXVI    | 61      | XXVI   | 8         | XXVI    | 61      | XXVI   | 441       | XXVI    | K       | XXVI   | K         | XXVI    | 63       |
| X    | 5 7 69 36    | XXVII   | 3555    | XXVII  | 8         | XXVII   | 3555    | XXVII  | 91        | XXVII   | L       | XXVII  | L         | XXVII   | 3546     |
| IX   | (54 33)      | XXVIII  | 96      | XXVIII | 14        | XXVIII  | 96      | XXVIII | 7         | XXVIII  | M       | XXVIII | M         | XXVIII  | 15 4     |
| X    | 3 9          | XXIX    | 4       | XXIX   | 6         | XXIX    | 4       | XXIX   | 5         | XXIX    | 4       | XXIX   | 4         | XXIX    | 8        |
| IX   | 5 7 394      | XXX     | 6       | XXX    | 5         | XXX     | 6       | XXX    | 8         | XXX     | H       | XXX    | H         | XXX     | 4        |
| X    |              | XXXI    |         | XXXI   |           | XXXI    |         | XXXI   |           | XXXI    | 7 56    | XXXI   | 7 56      | XXXI    | 79       |
| IX   | (5 77)       | XXXII   |         | XXXII  |           | XXXII   |         | XXXII  |           | XXXII   |         | XXXII  |           | XXXII   |          |
| X    | 38 I         |         | 6 75 39 |        | 96 8 678  |         | 6 75 39 |        | 3 74 63   |         | 3 65 7  |        | 3 65 7    |         | 3 687 8  |
| IX   | 5 7 36 8     |         |         |        |           |         |         |        |           |         | J       |        | J         |         |          |
| IX   | (5 44)       |         |         |        |           |         |         |        |           |         | 3 7 4   |        | 3 7 4     |         |          |
| X    | 54 6 J       |         |         |        |           |         |         |        |           |         | K       |        | K         |         |          |
| IX   | 5 7 3 5 3    |         |         |        |           |         |         |        |           |         | 6       |        | 6         |         |          |
| X    | (8 3)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 63 K         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 4 87         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 5)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 4 L          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 3 3 35       |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 500)      |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 8 M          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 9            |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 5)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 3 6 N        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 86           |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 4)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 5 O          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 3 46 38      |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | P            |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 89 687       |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 4488)     |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 375 - 4      |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 883 6 5 5    |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (8 47)       |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 69 3 - 1     |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 59 997       |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (8 4)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 38 S         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 8 49         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (8)          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 76 T         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 3            |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 44997)    |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 345 7 - 1 4  |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 99 8 3 544 5 |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 5)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | V            |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 4 4          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 449)      |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 79 W         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 37 376       |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 45)       |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 48 X         |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 5            |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 5)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 7 Y          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 8            |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | (6 4)        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| X    | 1 3 Z        |         |         |        |           |         |         |        |           |         |         |        |           |         |          |
| IX   | 7 3          |         |         |        |           |         |         |        |           |         |         |        |           |         |          |

# Tables of the Four Great Satellites of Jupiter

SATELLITE II—PHENOMENA, 1892 SEPTEMBER 6, 8, 10

Eclipse, Dis.

Shadow, Ing. and Eg.

Transit, Ing. and Eg.

Occultation, Re.

| Semidurations  |   |   |  |  |
|--|---|---|--|--|
| L  | <sup>d</sup> 0.052414   | <sup>d</sup> 0.052487   | <sup>d</sup> 0.049121  | <sup>d</sup> 0.049060  |
| LI   | +7  | "   | "  | +7   |
| LII  | 7   | 7   | 7  | 8  |
| LIII   | "   | "   | —11  | 11   |
| LIV  | 69  | "   | "  | 68   |
| LV   | "   | 54  | 58   | "  |
| LVI  | 333   | 935   | 854  | 402  |
|  | <u>0.052830</u>   | <u>0.053483</u> Eg.   | <u>0.050029</u> Ing.   | <u>0.049556</u>  |
| LXVI   |   | +2<br>—395<br><u>0.053090</u> Ing.  | +2<br>—369<br><u>0.049662</u> Eg.  |  |
| Reductions to Middle                                 |   |   |  |  |
| LVII   | <sup>d</sup> —0.001118  | <sup>d</sup> —0.001397  | <sup>d</sup> —0.001238   | <sup>d</sup> —0.000994   |
| LVIII  | 91  | 64  | 32   | 67   |
| LIX  | 26  | 94  | 88   | 34   |
| LX   | 3   | 37  | 37   | 3  |
| LXI  | 6   | 4   | 5  | 7  |
| LXII   | 7   | 7   | 6  | 6  |
| LXIII  | 31  | 31  | 26   | 26   |
| LXIV   | "   | "   | "  | —47  |
| LXV  | "   | "   | —62  | "  |
| Var.   | +15   | —19   | —19  | +16  |
|  | <u>—0.000939</u>  | <u>—0.001179</u> Eg.  | <u>—0.001125</u> Ing.  | <u>—0.000882</u>   |
| LXVI   | "   | +17<br><u>—0.001162</u> Ing.  | +16<br><u>—0.001109</u> Eg.  |  |
| Apparent Times of the Phenomena                      |   |   |  |  |
| CIV, CV<br>Approx.<br>Comp.<br>Semidur.<br>Reduction | <sup>d</sup> 0.023805<br>6.701500<br>—1240<br>—52830<br>—939<br><u>—55009</u> ←<br>6.670296 | <sup>d</sup> 0.023710<br>8.466600<br>—311<br>—53090<br>—1162<br><u>—54563</u> ←<br>8.435747 | <sup>d</sup> 0.023706<br>8.536100<br>919<br>—50029<br>—1125<br><u>—51154</u> ←<br>8.509571 |  |
| CIV, CV<br>Approx.<br>Comp.<br>Semidur.<br>Reduction |   | <sup>d</sup> 0.023710<br>8.466600<br>—311<br>53483<br>—1179<br>—1490<br><u>8.542303</u>     | <sup>d</sup> 0.023706<br>8.536100<br>919<br>49662<br>—1109<br><u>—1109</u> ←<br>8.609278   | <sup>d</sup> 0.023615<br>10.319500<br>—67<br>49556<br>—882<br><u>—949</u> ←<br>10.391722 |
| CVIII<br>LXVIII, }<br>LXIX }                         | Ecl. Dis. Sept. <sup>d h m s</sup> 6 16 5 13.6<br>Δ <i>k</i> per 1 <sup>s</sup> +.0200      | Sh. I. Sept. <sup>d h m s</sup> 8 10 27 28.5<br>Sh. E. 8 13 0 55.0                          | Tr. I. Sept. <sup>d h m s</sup> 8 12 13 46.9<br>Tr. E. 8 14 37 21.6                        | Oc. R. Sept. <sup>d h m s</sup> 10 9 24 4.8  |

# Introduction

## SATELLITE III

The following phenomena are calculated together with the places of the Satellite that are necessary for this purpose — 1910 March 31 Eclipse Disappearance and Reappearance April 3 Shadow Ingress and Egress Transit Ingress and Egress The Occultation which takes place on March 31 is also calculated but it is invisible since both phases occur while the Eclipse is in progress

| Superior Hel oc     |   |  | Superior Geoc  |  |  | Inferior Hel oc  |  |  | Inferior Geoc  |  |  |
|---------------------|---|--|--|--|--|--|--|--|--|--|--|
| Arg ments           | Equations                                     | Argu ments   | Equations  | Argu ments   | Equations  | Argu ments   | Equations  | Argu ments   | Eq ations  |  |  |
| I<br>II<br>III<br>p | (5667 4)<br>2039 7<br>86 0 2125 7<br>a        | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   | IV<br>V<br>VI<br>a<br>2125 7   |  |  |
| I<br>II<br>III<br>p | (601 12)<br>311 78<br>86 00<br>13 397 91<br>β | p  | p — 00034  | β<br>2 61  | p — 00177  | β<br>2 61  | p — 00177  | β<br>2 61  | p — 00182  |  |  |
| I<br>II<br>III<br>p | (634 7)<br>2 0<br>86 0<br>1<br>γ<br>88 1      | γ<br>88 1  | γ<br>88 1  | γ<br>91 7  | γ<br>91 7  | γ<br>91 7  | γ<br>91 7  | γ<br>91 7  | γ<br>91 7  |  |  |
| I<br>II<br>III<br>p | (2 95)<br>2 41<br>1 39<br>13<br>δ<br>3 93     | δ<br>3 93  | δ<br>3 93  | δ<br>7 51  | δ<br>7 51  | δ<br>7 51  | δ<br>7 51  | δ<br>7 51  | δ<br>7 51  |  |  |
| I<br>II<br>III<br>p | (2 84)<br>3 38<br>13<br>13<br>ε<br>3 64       | ε<br>3 64  | ε<br>3 64  | ε<br>7 22  | ε<br>7 22  | ε<br>7 22  | ε<br>7 22  | ε<br>7 22  | ε<br>7 22  |  |  |
| I<br>II<br>III<br>p | (2 85)<br>4 88<br>14<br>13<br>ζ<br>5 15       | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 | I<br>II<br>III<br>p<br>VII<br>VIII<br>IX<br>X<br>4 1261<br>26 9966<br>1260<br>34<br>16<br>42<br>34<br>28 |  |  |
| I<br>II<br>III<br>p | (2 85)<br>4 36<br>14<br>13<br>η<br>4 63       | η<br>4 63  | η<br>4 63  | η<br>8 21  | η<br>8 21  | η<br>8 21  | η<br>8 21  | η<br>8 21  | η<br>8 21  |  |  |
| Mar 31 2607         | Mar 31 2573                                   | Mar 31 2573  | Mar 31 2573  | Mar 31 2573  | Mar 31 2573  | Mar 31 2573  | Mar 31 2573  | Mar 31 2573  | Mar 31 2573  |  |  |
| April 3 8410        | April 3 8229                                  | April 3 8229   | April 3 8229   | April 3 8229   | April 3 8229   | April 3 8229   | April 3 8229   | April 3 8229   | April 3 8229   |  |  |

Nt —Th d t t pply th q t fT bl III t th t f m l 6 fT bl I h w b h b d t lly mtt d f mth f t fp 14

## ACCESSORY QUANTITIES

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| C | 8<br>0<br>log R<br>log Δ<br>2<br>p<br>To compare<br>with Sat<br>XLIII ⊕ Jovic Lat | 99 32 8<br>0 648767<br>189 41 43 8<br>189 69550 | 99 32 8<br>10 9 22 5<br>9 999714<br>0 648767<br>189 41 42 9<br>—0 6 12 7<br>189 59172<br>—0 08210 | 99 32 8<br>0 648919<br>189 57 58 0<br>189 96611 | 99 32 8<br>13 40 16 1<br>0 000171<br>0 648918<br>189 57 53 1<br>—0 49 55 1<br>189 13278<br>—0 08195 |
|---|---|---|---|---|---|

# Tables of the Four Great Satellites of Jupiter

## SATELLITE III—LONGITUDE, LATITUDE AND RADIUS VECTOR

1910

March 31<sup>st</sup> 260700

March 31<sup>st</sup> 257300

April 3<sup>rd</sup> 841000

April 3<sup>rd</sup> 822900

| Arguments |   | Longitude   |  | Argu-<br>ments  | Longitude   |   | Argu-<br>ments   | Longitude   |  | Argu-<br>ments   | Longitude   |   |  |
|-----------|---|---|--|---|---|---|--|---|--|--|---|---|--|
| XI<br>XII | (2 <sup>h</sup> 949 <sup>m</sup> 07 <sup>s</sup> )<br>5 <sup>h</sup> 329 <sup>m</sup> 52 <sup>s</sup><br>5 <sup>h</sup> 649 <sup>m</sup> 57 <sup>s</sup> 3 <sup>h</sup> 92816 | XI<br>XII<br>XIII {<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV<br>XXVI<br>XXVII<br>XXVIII<br>XXIX<br>XXX<br>XXXI<br>XXXII | 327°60053<br>208°58817<br>13°08259<br>3522<br>9449<br>3719<br>48<br>19066<br>749<br>149<br>28<br>101<br>925<br>31<br>267<br>902<br>50<br>1326<br>1009<br>208<br>7<br>223<br>16 | A<br>3 <sup>h</sup> 92476<br>B<br>8 <sup>h</sup> 021<br>C<br>3 <sup>h</sup> 51<br>D<br>3 <sup>h</sup> 6357<br>E<br>5 <sup>h</sup> 1524<br>F<br>4 <sup>h</sup> 21<br>G<br>2 <sup>h</sup> 73<br>H<br>3 <sup>h</sup> 57<br>I<br>28 <sup>h</sup> 12<br>J<br>164<br>K<br>30 <sup>h</sup> 05<br>L<br>23 <sup>h</sup> 42<br>M<br>406 <sup>h</sup> 20<br>N<br>1910 <sup>h</sup> 2<br>O<br>+146<br>P<br>2 <sup>h</sup> 54<br>Q<br>+1<br>R<br>0 <sup>h</sup> 62<br>S<br>+15<br>T<br>0 <sup>h</sup> 43<br>U<br>+1<br>V<br>2 <sup>h</sup> 6 | XI<br>XII<br>XIII {<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV<br>XXVI<br>XXVII<br>XXVIII<br>XXIX<br>XXX<br>XXXI<br>XXXII | 327°60053<br>208°58817<br>12°57941<br>36732<br>9430<br>3719<br>48<br>19117<br>752<br>149<br>28<br>101<br>925<br>31<br>267<br>902<br>51<br>1326<br>1009<br>201<br>7<br>222<br>16 | A<br>0 <sup>h</sup> 45753<br>B<br>11 <sup>h</sup> 604<br>C<br>7 <sup>h</sup> 09<br>D<br>0 <sup>h</sup> 0639<br>E<br>1 <sup>h</sup> 5813<br>F<br>0 <sup>h</sup> 84<br>G<br>6 <sup>h</sup> 31<br>H<br>7 <sup>h</sup> 15<br>I<br>31 <sup>h</sup> 70<br>J<br>168<br>K<br>33 <sup>h</sup> 63<br>L<br>27 <sup>h</sup> 00<br>M<br>409 <sup>h</sup> 78<br>N<br>1910 <sup>h</sup> 3<br>O<br>+81<br>P<br>2 <sup>h</sup> 54<br>Q<br>+1<br>R<br>0 <sup>h</sup> 62<br>S<br>+8<br>T<br>4 <sup>h</sup> 01<br>U<br>+1<br>V<br>6 <sup>h</sup> 2 | XI<br>XII<br>XIII {<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV<br>XXVI<br>XXVII<br>XXVIII<br>XXIX<br>XXX<br>XXXI<br>XXXII | 327°60053<br>359°54110<br>42°26682<br>5032<br>4060<br>892<br>52<br>20978<br>15257<br>46<br>69<br>99<br>1145<br>32<br>253<br>932<br>57<br>1333<br>1005<br>215<br>7<br>225<br>16 | A<br>0 <sup>h</sup> 43943<br>B<br>11 <sup>h</sup> 587<br>C<br>7 <sup>h</sup> 07<br>D<br>0 <sup>h</sup> 0458<br>E<br>1 <sup>h</sup> 5632<br>F<br>0 <sup>h</sup> 82<br>G<br>6 <sup>h</sup> 29<br>H<br>7 <sup>h</sup> 13<br>I<br>31 <sup>h</sup> 68<br>J<br>168<br>K<br>33 <sup>h</sup> 61<br>L<br>26 <sup>h</sup> 98<br>M<br>409 <sup>h</sup> 76<br>N<br>1910 <sup>h</sup> 3<br>O<br>+239<br>P<br>2 <sup>h</sup> 52<br>Q<br>+2<br>R<br>0 <sup>h</sup> 60<br>S<br>+24<br>T<br>3 <sup>h</sup> 99<br>U<br>+2<br>V<br>6 <sup>h</sup> 2 | XI<br>XII<br>XIII {<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV<br>XXVI<br>XXVII<br>XXVIII<br>XXIX<br>XXX<br>XXXI<br>XXXII | 327°60053<br>359°54110<br>41°26047<br>14592<br>4167<br>880<br>52<br>20701<br>15234<br>47<br>70<br>98<br>1144<br>32<br>253<br>932<br>56<br>1333<br>1005<br>178<br>8<br>216<br>17 |  |
|           |   | 189°°68924  |  |   |   | 189°°51844  |  |   |  | 9°°92550   |   | 9°°01225  |  |
|           |   | Comp <sup>t</sup> .<br>XLVI<br>Var <sup>n</sup> .   |  | +0°°00626<br>+0 <sup>d</sup> °000124<br>"   |   | Comp <sup>t</sup> .<br>XLVI<br>Var <sup>n</sup> .   |  | +0°°07328<br>+0 <sup>d</sup> °001459<br>+3  |  | Comp <sup>t</sup> .<br>XLVI<br>Var <sup>n</sup> .  |   | +0°°12053<br>+0 <sup>d</sup> °002400<br>-5  |  |
|           |   | Variation   |  |   |   | Variation   |  |   |  | Variation  |   | Variation   |  |
|           |   | +°00212   |  |   |   | +°00212   |  |   |  | -°00221  |   | -°00222   |  |
|           |   | Rad. Vec.   |  | 283''°99  |   | Rad. Vec.   |  | 283''°99  |  | Rad. Vec.  |   | 283''°38  |  |
|           |   | Latitude  |  |   |   | Latitude  |  |   |  | Latitude   |   | Latitude  |  |
|           |   | 0°27036   |  |   |   | 0°18921   |  |   |  | 1°73339  |   | 1°80760   |  |
|           |   | XLVIII  |  | -10   |   | XLVIII  |  | -41   |  | XLVIII   |   | -41   |  |
|           |   | 0°27026   |  |   |   | 0°18880   |  |   |  | 1°73329  |   | 1°80719   |  |
|           |   | XLV   |  | -2°°6096  |   | XLV   |  | -2°°6062  |  | XLV  |   | +2°°6158  |  |
|           |   | XLV   |  | -2°°5882  |   | XLV   |  | -2°°5882  |  | XLV  |   | +2°°5882  |  |

# Introduction

## SATELLITE III—PHENOMENA 1910 MARCH 31 APRIL 3

Eclipse Dis and Re

Occultation Dis and Re

Shadow Ing and Eg

Transit Ing and Eg

| Semidurations                   |                           |                           |                           |                           |
|---------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| XLIX                            | <sup>d</sup><br>0 052042  | <sup>d</sup><br>0 044495  | <sup>d</sup><br>0 051610  | <sup>d</sup><br>0 044793  |
| L                               |                           |                           |                           |                           |
| LI                              | —17                       | —17                       |                           |                           |
| LII                             | 10                        | 10                        | 10                        | 10                        |
| LIII                            |                           | 34                        |                           | —34                       |
| LIV                             | 130                       | 130                       |                           |                           |
| LV                              |                           |                           | 114                       | 113                       |
|                                 | <u>0 052165</u>           | <u>0 044652</u>           | <u>0 051734</u> Ing       | <u>0 044882</u> Eg        |
| LXV                             |                           |                           | 0                         | 0                         |
|                                 |                           |                           | —6                        | —5                        |
|                                 |                           |                           | <u>0 051728</u> Eg        | <u>0 044877</u> Ing       |
| Reductions to Middle            |                           |                           |                           |                           |
| LVI                             | <sup>d</sup><br>—0 001856 | <sup>d</sup><br>—0 001859 | <sup>d</sup><br>—0 002395 | <sup>d</sup><br>—0 002411 |
| LVII                            | 2                         | 2                         | 2                         | 2                         |
| LVIII                           | 134                       | 133                       | 113                       | 108                       |
| LIX                             | 15                        | 15                        | 10                        | 11                        |
| LX                              | 5                         | 5                         | 6                         | 5                         |
| LXI                             | 10                        | 10                        | 11                        | 11                        |
| LXII                            | 26                        | 26                        | 14                        | 14                        |
| LXIII                           |                           | —157                      |                           |                           |
| LXIV                            |                           |                           |                           | —207                      |
| Var                             | —3                        | —4                        | +5                        | +5                        |
|                                 | <u>—0 001667</u>          | <u>—0 001829</u>          | <u>—0 00 34</u> Ing       | <u>—0 00 462</u> Eg       |
| LXV                             |                           |                           |                           |                           |
|                                 |                           |                           | <u>—0 002234</u> Eg       | <u>—0 002462</u> Ing      |
| Apparent Times of the Phenomena |                           |                           |                           |                           |
| CIV CV                          | <sup>d</sup><br>0 025702  | <sup>d</sup><br>0 025702  | <sup>d</sup><br>0 025711  | <sup>d</sup><br>0 025711  |
| Approx                          | Mar 31 260700             | Mar 31 257300             | Apr 3 841000              | Apr 3 822900              |
| Comp                            | 124                       | 1462                      | 806                       | 2395                      |
| Semidur                         | —52165                    | —44652                    | —51734                    | —44877                    |
| Reduction                       | —1667                     | —1829                     | —2234                     | —2462                     |
|                                 | <u>—53832</u> ←           | <u>—46481</u> ←           | <u>—53968</u> ←           | <u>—47339</u> ←           |
|                                 | Mar 31 232694             | Mar 31 237983             | Apr 3 813549              | Apr 3 803667              |
| CIV CV                          | <sup>d</sup><br>0 025702  | <sup>d</sup><br>0 025702  | <sup>d</sup><br>0 025711  | <sup>d</sup><br>0 025711  |
| Approx                          | Mar 31 260700             | Mar 31 257300             | Apr 3 841000              | Apr 3 822900              |
| Comp                            | 124                       | 1462                      | 806                       | 2395                      |
| Semidur                         | 52165                     | 44652                     | 51728                     | 44882                     |
| Reduction                       | —1667                     | —1829                     | —2234                     | —2462                     |
|                                 | <u>—1667</u> ←            | <u>—1829</u> ←            | <u>—2234</u> ←            | <u>—2462</u> ←            |
|                                 | Mar 31 337024             | Mar 31 327287             | Apr 3 917011              | Apr 3 893426              |
| CVIII                           | Ecl Dis Mar 31 5 35 48    | Occ Dis Mar 31 5 42 41 7  | Sh Ing Apr 3 19 31 30 6   | Tr Ing Apr 3 19 17 16 8   |
| LXVII                           | Re 8 5 18 9               | Re 7 5 1 17 6             | Eg 22 0 29 8              | Eg 21 26 32 0             |
| LXVIII                          | Δ(k) per 1 ± 00748        |                           |                           |                           |



# Tables of the Four Great Satellites of Jupiter

## SATELLITE IV

The phenomena calculated below are, 1886 April 30, Eclipse and Occultation, followed by May 8, Shadow and Transit. All these phenomena are very near the limits. The occultation reappearance takes place before the eclipse begins, so that the complete set of phenomena would be visible. In the course of the calculation the places of the Satellite are found.

| Superior Helioc.   |   | Superior Geoc.                             |   | Inferior Helioc.    |  | Inferior Geoc.                            |   |
|--|---|--|---|---------------------|--|---|---|
| Arguments  | Equations   | Arguments                                  | Equations   | Arguments           | Equations  | Arguments                                 | Equations   |
| I<br>(5667.4)<br>1939.5 $\alpha$<br>II 117.3 2056.8                    | IV<br>V<br>VI<br>" " "  | $\alpha$<br>2056.8                         | IV — $\alpha$ 0.4545<br>V 968<br>VI 132   | $\alpha$<br>2065.2  | IV — $\alpha$ 0.5069<br>V 980<br>VI 151  | $\alpha$<br>2065.2                        | IV — $\alpha$ 0.5069<br>V 980<br>VI 151   |
| I<br>(601.12)<br>II 321.15<br>III 117.27 $\beta$<br>34 39.88           | $p$ "   | $\beta$<br>39.88                           | $p$ — 0.3445  | $\beta$<br>48.26    | $p$ — 0.3938   | $\beta$<br>48.26                          | $p$ — 0.3938  |
| I<br>(634.7)<br>II 2.1<br>III 117.3 $\gamma$<br>3 119.7                |   | $\gamma$<br>119.7                          |   | $\gamma$<br>128.1   |  | $\gamma$<br>128.1                         |   |
| I<br>(83.310)<br>II 11.755<br>III .442<br>339 $\delta$<br>$p$ " 12.536 |   | $\delta$<br>12.536<br>$p$ — .345<br>12.191 |   | $\delta$<br>4.220   |  | $\delta$<br>4.220<br>$p$ — .394<br>3.826  |   |
| I<br>(83.31)<br>II 9.79<br>III .45<br>34 $\epsilon$<br>$p$ " 10.58     |   | $\epsilon$<br>10.58<br>$p$ — .34<br>10.24  |   | $\epsilon$<br>18.96 |  | $\epsilon$<br>18.96<br>$p$ — .39<br>18.57 |   |
|  | I $\alpha$ 2.9991<br>II Apr. 27.2749<br>III .3386<br>$p$ "<br>VII 792<br>VIII 114<br>Apr. 30.7032 |  | I $\alpha$ 2.9991<br>II Apr. 27.2749<br>III .3386<br>$p$ — .3445<br>VII 788<br>VIII 114<br>Apr. 30.3583 |                     | I $\alpha$ 11.3759<br>II Apr. 27.2749<br>III .3357<br>$p$ "<br>VII 9<br>VIII 114<br>May 8.9988 |   | I $\alpha$ 11.3759<br>II Apr. 27.2749<br>III .3357<br>$p$ — .3938<br>VII 12<br>VIII 113<br>May 8.6052 |

## ACCESSORY QUANTITIES

|                        |              |               |                |                |
|------------------------|--------------|---------------|----------------|----------------|
| $\odot$                | 99° 18'.3    | 99° 18'.3     | 99° 18'.3      | 99° 18'.3      |
| $\log R_r$             | "            | 40° 23' 26".8 | "              | 48° 22' 35".0  |
| $\log \Delta$          | "            | .003477       | "              | .004324        |
| $z$                    | .670520      | .670176       | .679354        | .678912        |
| $p$                    | 184° 9' 8".0 | 184° 7' 34".2 | 184° 46' 44".5 | 184° 44' 57".4 |
| To compare)            | "            | —7° 19' 22".1 | "              | —8° 23' 40".6  |
| with Sat.)             | 184° 15.222  | 176° 8.0336   | 184° 77.903    | 176° 35.467    |
| $\oplus$ , Jovic. Lat. | "            | —0.11874      | "              | —0.10571       |

# Introduction

## SATELLITE IV—LONGITUDE LATITUDE AND RADIUS VECTOR

886

Ap 13 7 3

Ap 13 358300

M y 8 9988

M y 8 6 5 00

|      | A g m t                                | L g t d  | A g m t         | L g t d  | A g m t     | L g t d  | A g m t      | I g t d  |
|------|--|--|-----------------|--|-------------|--|--------------|--|
| IX X | (8 )<br>97 A<br>97 96                  | IX X<br>68 3 436<br>XI { 15 9978<br>97 3<br>83   | A 6             | IX X<br>68 3 436<br>XI { 7 54989<br>79 4<br>47<br>63   | A 36        | IX X<br>00 3 436<br>XI { 41 3<br>1 3554<br>8983  | A 1 94       | IX X<br>41 3<br>1 94 67<br>1 7   |
| IX X | (5 49)<br>86 B<br>3 4 4 7              | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | B 3 9           | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | B 3 55      | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | B 3 5        | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV |
| IX X | (87 477)<br>6 699 C<br>7 994 7         | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | C 8 5           | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | C 0 466     | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | C 7          | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV |
| IX X | (83 3 6)<br>7 43 D<br>3 84 1 85        | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | D 74            | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | D 687       | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | D 93         | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV |
| IX X | (83 3 954)<br>8 7 538 E<br>3 87 57538  | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | E 3 48          | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | E 4 18 5    | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | E 3 7869     | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV |
| IX X | (49 84 )<br>67 F<br>387 2 57           | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | F 7             | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | F 9 353     | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV | F 8 959      | XII<br>XIII<br>XIV<br>XV<br>XVI<br>XVII<br>XVIII<br>XIX<br>XX<br>XXI<br>XXII<br>XXIII<br>XXIV<br>XXV |
| IX X | ( 6 )<br>5 8 G<br>3 43 3               | C mp <sup>t</sup><br>XL<br>V   | G 8 6           | C mp <sup>t</sup><br>XL<br>V   | G 5         | C mp <sup>t</sup><br>XL<br>V   | G 8 3        | C mp <sup>t</sup><br>XL<br>V   |
| IX X | (83 83)<br>4 4 II<br>983 4 397         | V t  | H 4 5           | V t  | II 693      | Var t  | H 2 99       | V t  |
| IX X | (5667 4)<br>936 3 57                   | XXVI<br>XXVII<br>XXVIII<br>XXIX  | I 886 3         | XXVI<br>XXVII<br>XXVIII<br>XXIX  | I 886 4     | XXVI<br>XXVII<br>XXVIII<br>XXIX  | I 886 4      | XXVI<br>XXVII<br>XXVIII<br>XXIX  |
| IX X | (83 3 98)<br>6 745 5 J<br>3 88 9 6 5 4 | - 37   | J 8 34<br>+354  | + 51   | J 3 8<br>+  | + 38   | J 838<br>+44 | - 00 79  |
| IX X | ( 656 )<br>5 34 K<br>3 885 883         | P d V 498 89   | K 538           | R d V 499 36   | K 835       | R d V 499 8  | K 441        | R d V 498 54   |
| IX X | ( 66 )<br>5 8 L<br>3 9 36              | L t t d  | L               | L t t d  | L 1 3       | L t t d  | L 9          | L t t d  |
| IX X | (83 3 4)<br>3 94 9 M<br>3 8898 7 83 7  | XXX<br>XXXI<br>XXXII<br>XXXIII<br>XXXIV<br>XXXV<br>XXXVI<br>XXXVII<br>XXXVIII                        | M 7 4858<br>+35 | XXX<br>XXXI<br>XXXII<br>XXXIII<br>XXXIV<br>XXXV<br>XXXVI<br>XXXVII<br>XXXVIII                        | M 6 63<br>+ | XXX<br>XXXI<br>XXXII<br>XXXIII<br>XXXIV<br>XXXV<br>XXXVI<br>XXXVII<br>XXXVIII                        | M 5 73 7     | XXX<br>XXXI<br>XXXII<br>XXXIII<br>XXXIV<br>XXXV<br>XXXVI<br>XXXVII<br>XXXVIII                        |
| IX X | (83 3 6)<br>4 864 N<br>3 9 8 8 78      | XXXVI<br>XXXVII<br>XXXVIII   | N 8 437         | XXXVI<br>XXXVII<br>XXXVIII   | N 394       | XXXVI<br>XXXVII<br>XXXVIII   | N            | XXXVI<br>XXXVII<br>XXXVIII   |
| IX X | (83 8)<br>3 39 O<br>97 6 36            | 5341   | O 6             | 54856  | O 14 66     | 2 45 89  | O 4 6        | 2 4 87   |
| IX X | (83 )<br>75 P<br>2 51 5 6              | XLII<br>XLIII<br>XLIV  | P 4 9           | XLII<br>XLIII<br>XLIV  | P 6 68      | XLII<br>XLIII<br>XLIV  | P 6 8        | XLII<br>XLIII<br>XLIV  |
| IX X | (83 38)<br>4 3 Q<br>4 33 1 84          | 5349   | Q 1 49          | 54854  | Q 1 4       | 45 44  | Q 9 74       | 40077  |
| IX X | (83 5)<br>6 5 R<br>3 43 73             | XXXIX - 9647   | R 38            | XXXIX -1 6940  | R 1 3       | XXXIX +1 9 9   | R 63         | XXXIX +1 6 19  |

# Tables of the Four Great Satellites of Jupiter

SATELLITE IV—PHENOMENA, 1886 APRIL 30, MAY 8

Eclipse, Dis. and Re.

Occultation, Dis. and Re.

Shadow, Ing. and Eg.

Transit, Ing. and Eg.

## Semidurations

|        |                          |                          |                          |                          |
|--------|--------------------------|--------------------------|--------------------------|--------------------------|
| XLV    | <sup>d</sup><br>0°026549 | <sup>d</sup><br>0°031205 | <sup>d</sup><br>0°030747 | <sup>d</sup><br>0°043824 |
| XLVI   | "                        | "                        | "                        | "                        |
| XLVII  | "                        | "                        | "                        | "                        |
| XLVIII | "                        | "                        | "                        | "                        |
| XLIX   | —50                      | —50                      | "                        | "                        |
| L      | 11                       | 11                       | 11                       | 12                       |
| LI     | "                        | +125                     | "                        | —77                      |
|        | <u>0°026510</u>          | <u>0°031291</u>          | <u>0°030758</u> Ing.     | <u>0°043759</u> Eg.      |
| LXI    | "                        | "                        | —335                     | —477                     |
|        |                          |                          | <u>0°030423</u> Eg.      | <u>0°043282</u> Ing.     |

## Reductions to Middle

|       |                           |                           |                           |                           |
|-------|---------------------------|---------------------------|---------------------------|---------------------------|
| LII   | <sup>d</sup><br>—0°003732 | <sup>d</sup><br>—0°003744 | <sup>d</sup><br>—0°004879 | <sup>d</sup><br>—0°004839 |
| LIII  | 364                       | 502                       | 322                       | 510                       |
| LIV   | 158                       | 146                       | 167                       | 151                       |
| LV    | 63                        | 70                        | 64                        | 72                        |
| LVI   | 22                        | 23                        | 78                        | 78                        |
| LVII  | 10                        | 10                        | "                         | "                         |
| LVIII | "                         | "                         | 90                        | 90                        |
| LIX   | "                         | —345                      | "                         | "                         |
| LX    | "                         | "                         | "                         | —436                      |
| Var.  | +1                        | —5                        | —2                        | +8                        |
|       | <u>—0°003114</u>          | <u>—0°003343</u>          | <u>—0°004160</u> Ing.     | <u>—0°004366</u> Eg.      |
| LXI   | "                         | "                         | +92                       | +97                       |
|       |                           |                           | <u>—0°004068</u> Eg.      | <u>—0°004269</u> Ing.     |

## Apparent Times of the Phenomena

|  |   |   |  |  |
|--|---|---|--|--|
| CIV, CV<br>Approx.<br>Comp <sup>t</sup> .<br>Semidur <sup>n</sup> .<br>Reduction | <sup>d</sup><br>Apr. 30°7025<br>Apr. 30°703200<br>— 502<br>—26510<br>— 3114<br>—30126 ←<br>Apr. 30°700099 | <sup>d</sup><br>Apr. 30°27003<br>Apr. 30°358300<br>3535<br>—31291<br>— 3343<br>—34634 ←<br>Apr. 30°354204 | <sup>d</sup><br>May 8°027581<br>May 8°998800<br>1102<br>—30758<br>— 4160<br>—34918 ←<br>May 8°992565 | <sup>d</sup><br>May 8°027552<br>May 8°605200<br>4402<br>—43282<br>— 4269<br>—47551 ←<br>May 8°589603 |
| CIV, CV<br>Approx.<br>Comp <sup>t</sup> .<br>Semidur <sup>n</sup> .<br>Reduction | <sup>d</sup><br>Apr. 30°7025<br>Apr. 30°703200<br>— 502<br>26510<br>— 3114<br>— 3616 ←<br>Apr. 30°753119  | <sup>d</sup><br>Apr. 30°27003<br>Apr. 30°358300<br>3535<br>31291<br>— 3343<br>— 3343 ←<br>Apr. 30°416786  | <sup>d</sup><br>May 8°027581<br>May 8°998800<br>1102<br>30423<br>— 4068<br>— 4068 ←<br>May 9°053838  | <sup>d</sup><br>May 8°027552<br>May 8°605200<br>4402<br>43759<br>— 4366<br>— 4366 ←<br>May 8°676547  |
| CVIII<br>LXIII, LXIV   | Ecl., Dis. Apr. 30 <sup>d h m s</sup> 16 48 8.6<br>Re. 18 4 29.5<br>Δ(k) per 1 <sup>s</sup> ±.00119       | Occ., Dis. Apr. 30 <sup>d h m s</sup> 8 30 3.2<br>Re. 10 0 10.3   | Sh., Ing. May 8 <sup>d h m s</sup> 23 49 17.6<br>Eg. 9 1 17 31.6                                     | Tr., Ing. May 8 <sup>d h m s</sup> 14 9 1.7<br>Eg. 16 14 13.7  |

# SATELLITE I



## Approximate Tables

of true

Heliocentric and Geocentric Conjunction

# SATELLITE I

## Approximate Tables of Conjunction

I

Epochs of Conjunction

| 1            | 2                      | 3                              | 4                      | 5       | 6        | 7        | 8          |  |
|--------------|------------------------|--------------------------------|------------------------|---------|----------|----------|------------|--|
| Year         | Conjunction            | Variation for 100 <sup>d</sup> | $\alpha$               | $\beta$ | $\gamma$ | $\delta$ | $\epsilon$ |  |
| <b>1850</b>  | <sup>d</sup><br>1°0169 | ...                            | <sup>d</sup><br>1786°1 | 333°32  | 0°5      | 1°342    | °99        | Column 2 corrected by the equations from the following tables, gives superior conjunction as required for Eclipses and Occultations. To find inferior conjunction for Shadows and Transits, add (or subtract) one half the synodic period, i. e. 0 <sup>d</sup> .8849, to the numbers in columns 2, 4, 5, 6, 7, 8. |
| <b>1851</b>  | 0°6082                 | ...                            | 2150°8                 | 299°03  | 365°1    | 1°048    | 1°14       |  |
| <b>*1852</b> | 0°1995                 | ...                            | 2515°6                 | 264°74  | 364°4    | °753     | 1°28       |  |
| <b>1853</b>  | 0°5607                 | ...                            | 2882°1                 | 232°21  | 0°3      | °466     | 1°43       |  |
| <b>1854</b>  | 0°1519                 | ...                            | 3246°7                 | 197°92  | 364°9    | °172     | 1°58       |  |
| <b>1855</b>  | 1°5132                 | ...                            | 3613°2                 | 165°40  | 0°7      | 1°648    | 1°73       |  |
| <b>*1856</b> | 1°1043                 | ...                            | 3977°5                 | 131°11  | 0°0      | 1°353    | °11        |  |
| <b>1857</b>  | 1°4654                 | ...                            | 11°2                   | 98°58   | 1°1      | 1°066    | °26        |  |
| <b>1858</b>  | 1°0566                 | ...                            | 375°7                  | 64°29   | 0°5      | °772     | °41        |  |
| <b>1859</b>  | 0°6479                 | ...                            | 740°2                  | 30°00   | 365°1    | °478     | °56        |  |
| <b>*1860</b> | 0°2392                 | ...                            | 1104°9                 | 394°59  | 364°4    | °184     | °71        | The constant -0 <sup>d</sup> .0333 has been applied to each of the entries in column 2.  |
| <b>1861</b>  | 0°6003                 | ...                            | 1471°5                 | 362°07  | 0°2      | 1°659    | °86        | The constant -0 <sup>d</sup> .030 has been applied to each of the entries in column 7.   |
| <b>1862</b>  | 0°1918                 | ...                            | 1836°4                 | 327°77  | 364°8    | 1°365    | 1°01       |  |
| <b>1863</b>  | 1°5529                 | ...                            | 2202°8                 | 295°25  | 0°7      | 1°078    | 1°16       |  |
| <b>*1864</b> | 1°1440                 | ...                            | 2567°0                 | 260°96  | 0°0      | °784     | 1°30       |  |
| <b>1865</b>  | 1°5049                 | - °0001                        | 2932°8                 | 228°44  | 1°1      | °497     | 1°45       | The constant -0 <sup>d</sup> .03 has been applied to each of the entries in column 8.  |
| <b>1866</b>  | 1°0959                 | - °0001                        | 3296°9                 | 194°14  | 0°4      | °203     | 1°60       |  |
| <b>1867</b>  | 0°6868                 | - °0001                        | 3660°6                 | 159°85  | 365°0    | 1°671    | 1°75       |  |
| <b>*1868</b> | 0°2780                 | ...                            | 4024°9                 | 125°56  | 364°3    | 1°377    | °13        |  |
| <b>1869</b>  | 0°6391                 | ...                            | 58°7                   | 93°03   | 0°2      | 1°090    | °28        | For Eclipses the argument $\gamma$ is not wanted.  |
| <b>1870</b>  | 0°2306                 | + °0001                        | 423°7                  | 58°74   | 364°8    | °796     | °43        |  |
| <b>1871</b>  | 1°5920                 | + °0001                        | 790°8                  | 26°22   | 0°6      | °508     | °58        |  |
| <b>*1872</b> | 1°1835                 | + °0001                        | 1156°2                 | 390°81  | 365°2    | °214     | °73        |  |
| <b>1873</b>  | 1°5449                 | ...                            | 1523°1                 | 358°29  | 1°1      | 1°690    | °88        |  |
| <b>1874</b>  | 1°1362                 | ...                            | 1888°0                 | 323°99  | 0°4      | 1°396    | 1°02       |  |
| <b>1875</b>  | 0°7275                 | ...                            | 2252°5                 | 289°70  | 365°0    | 1°101    | 1°17       |  |
| <b>*1876</b> | 0°3186                 | - °0001                        | 2616°5                 | 255°41  | 364°3    | °807     | 1°32       |  |
| <b>1877</b>  | 0°6794                 | - °0001                        | 2982°2                 | 222°89  | 0°2      | °520     | 1°47       |  |
| <b>1878</b>  | 0°2703                 | - °0001                        | 3346°1                 | 188°59  | 364°7    | °226     | 1°62       |  |
| <b>1879</b>  | 1°6312                 | ...                            | 3711°8                 | 156°07  | 0°6      | 1°702    | °00        |  |
| <b>*1880</b> | 1°2224                 | ...                            | 4076°3                 | 121°78  | 365°2    | 1°407    | °15        |  |
| <b>1881</b>  | 1°5836                 | ...                            | 110°4                  | 89°25   | 1°0      | 1°120    | °30        |  |
| <b>1882</b>  | 1°1752                 | + °0001                        | 475°6                  | 54°96   | 0°4      | °826     | °45        |  |
| <b>1883</b>  | 0°7667                 | + °0001                        | 840°8                  | 20°67   | 364°9    | °532     | °60        |  |
| <b>*1884</b> | 0°3581                 | ...                            | 1205°8                 | 385°26  | 364°3    | °238     | °75        |  |
| <b>1885</b>  | 0°7192                 | ...                            | 1572°2                 | 352°74  | 0°1      | 1°713    | °89        |  |
| <b>1886</b>  | 0°3104                 | ...                            | 1936°6                 | 318°44  | 364°7    | 1°419    | 1°04       |  |
| <b>1887</b>  | 1°6714                 | ...                            | 2302°6                 | 285°92  | 0°5      | 1°132    | 1°19       |  |
| <b>*1888</b> | 1°2625                 | ...                            | 2666°8                 | 251°63  | 365°1    | °838     | 1°34       |  |
| <b>1889</b>  | 1°6235                 | ...                            | 3032°8                 | 219°11  | 1°0      | °551     | 1°49       |  |
| <b>1890</b>  | 1°2147                 | ...                            | 3397°3                 | 184°81  | 0°3      | °256     | 1°64       |  |
| <b>1891</b>  | 0°8061                 | ...                            | 3762°2                 | 150°52  | 364°9    | 1°725    | °02        |  |
| <b>*1892</b> | 0°3975                 | ...                            | 4127°2                 | 116°23  | 364°2    | 1°431    | °17        |  |
| <b>1893</b>  | 0°7588                 | ...                            | 161°4                  | 83°71   | 0°1      | 1°144    | °32        |  |
| <b>1894</b>  | 0°3503                 | ...                            | 526°4                  | 49°41   | 364°7    | °849     | °47        |  |
| <b>1895</b>  | 1°7114                 | ...                            | 892°9                  | 16°89   | 0°5      | °562     | °61        |  |
| <b>*1896</b> | 1°3027                 | ...                            | 1257°4                 | 381°48  | 365°1    | °268     | °76        |  |
| <b>1897</b>  | 1°6637                 | ...                            | 1623°6                 | 348°96  | 0°9      | 1°744    | °91        |  |
| <b>1898</b>  | 1°2549                 | ...                            | 1987°8                 | 314°67  | 0°3      | 1°449    | 1°06       |  |
| <b>1899</b>  | 0°8459                 | ...                            | 2352°0                 | 280°37  | 364°9    | 1°155    | 1°21       |  |
| <b>1900</b>  | 0°4371                 | ...                            | 2716°4                 | 246°08  | 364°2    | °861     | 1°36       |  |
| Period       | ...                    | ...                            | 4332°6                 | 398°88  | 365°3    | 1°763    | 1°77       |  |

# SATELLITE I

## Approximate Tables of Conjunction

I continued

Epochs of Conjunction

| Year   | Conjunction            | 3<br>V <sub>1</sub> ation<br>fo 100 <sup>d</sup> | 4<br>$\alpha$          | 5<br>$\beta$ | 6<br>$\gamma$ | 7<br>$\delta$       | 8                    |   |
|--------|------------------------|--|------------------------|--------------|---------------|---------------------|----------------------|---|
| 1900   | <sup>d</sup><br>0 4371 |  | <sup>d</sup><br>2716 4 | 246 08       | 364 2         | <sup>d</sup><br>861 | <sup>d</sup><br>1 36 | Column 2 corrected by the equations from the following tables vs superior conjunction as required for eclipses and occultations. The difference of conjunction for Shadows and Transits added (or subtracted) one half the synodic period of 18849 to the numbers in columns 4 5 6 7 8. |
| 1901   | 0284                   |  | 3081 1                 | 11 79        | 363 5         | 567                 | 1 51                 |   |
| 1902   | 1 3896                 |  | 3447 8                 | 179 6        | 364 6         | 8                   | 1 66                 |   |
| 1903   | 09810                  |  | 3812 6                 | 144 97       | 364           | 1 748               | 04                   |   |
| *1904  | 0 5723                 |  | 4177 3                 | 11 68        | 363 3         | 1 454               | 19                   |   |
| 1905   | 0 9333                 |  | 210 8                  | 78 16        | 364 4         | 1 167               | 34                   |   |
| 1906   | 0 5 45                 |  | 575                    | 43 86        | 363 7         | 873                 | 48                   |   |
| 1907   | 0 1157                 |  | 939 6                  | 9 57         | 363 1         | 578                 | 63                   |   |
| *1908  | 1 4767                 |  | 13 5 9                 | 375 93       | 364           | 291                 | 78                   |   |
| 1909   | 0 0680                 |  | 1670 5                 | 341 64       | 363 5         | 1 760               | 93                   |   |
| 1910   | 1 4291                 |  | 2036 8                 | 3 9 12       | 364 6         | 1 473               | 1 08                 |   |
| 1911   | 1 0 05                 |  | 401 6                  | 74 8         | 363 9         | 1 179               | 1 3                  |   |
| *1912  | 0 6118                 |  | 766 3                  | 40 53        | 363 3         | 884                 | 1 38                 |   |
| 1913   | 0 9730                 |  | 313 8                  | 208 01       | 364 4         | 597                 | 1 53                 |   |
| 1914   | 0 5642                 |  | 3497 4                 | 173 7        | 363 7         | 3 3                 | 1 68                 |   |
| 1915   | 0 1554                 |  | 386 8                  | 139 4        | 363 0         | 009                 | 06                   |   |
| 1916   | 1 5164                 |  | 42 7 9                 | 106 90       | 364 1         | 1 484               | 21                   | The constant -0 <sup>d</sup> 033 has been applied to each of the entries in column 7.   |
| 1917   | 1 76                   |  | 259 6                  | 7 61         | 363 5         | 1 19                | 35                   |   |
| 1918   | 4687                   |  | 6 6 0                  | 4 8          | 364 6         | 903                 | 50                   |   |
| 1919   | 1 6                    |  | 990 7                  | 5 79         | 363 9         | 609                 | 65                   |   |
| 1920   | 0 6513                 |  | 1355 5                 | 370 38       | 363 2         | 315                 | 8                    |   |
| 1921   | 1 0126                 |  | 17 2 1                 | 337 86       | 364 3         | 8                   | 95                   |   |
| 1922   | 0 6040                 |  | 2087 1                 | 303 57       | 363 7         | 1 496               | 1 10                 |   |
| 1923   | 1951                   |  | 451 3                  | 269 7        | 363 0         | 1 202               | 1 5                  |   |
| *1924  | 1 5562                 |  | 817 6                  | 36 75        | 364 1         | 915                 | 1 40                 |   |
| 1925   | 0 1471                 | - 0001   | 3 81 4                 | 02 46        | 363 4         | 621                 | 1 55                 |   |
| 1926   | 1 5080                 | - 0001   | 3547 0                 | 169 94       | 364 5         | 334                 | 1 7                  |   |
| 1927   | 1 0989                 | - 0001   | 3910 9                 | 135 64       | 363 9         | 39                  | 08                   |   |
| 1928   | 6901                   |  | 4275                   | 1 1 35       | 363 2         | 1 508               | 2                    |   |
| 1929   | 1 0512                 |  | 3 9                    | 68 83        | 364 3         | 1 21                | 37                   |   |
| 1930   | 6428                   | + 0001   | 674                    | 34 53        | 363 6         | 926                 | 52                   |   |
| 1931   | 0 343                  | + 0001   | 1039 5                 | 0 24         | 363 0         | 63                  | 67                   | The constant -0 <sup>d</sup> 03 has been applied to each of the entries in column 8.  |
| *1932  | 1 5957                 | + 0001   | 1406 6                 | 366 6        | 364 1         | 345                 | 8                    |   |
| 1933   | 187                    |  | 1771 8                 | 33 31        | 363 4         | 051                 | 97                   |   |
| 1934   | 1 5484                 |  | 138 3                  | 299 79       | 364 5         | 1 5 7               | 1 12                 |   |
| 1935   | 1 1396                 |  | 2502 7                 | 65 49        | 363 8         | 1 23                | 1 7                  |   |
| *1936  | 0 7306                 | - 0 01   | 866 7                  | 31 20        | 363 1         | 938                 | 1 42                 |   |
| 1937   | 1 0914                 | - 0 01   | 3 32 3                 | 198 68       | 364 3         | 651                 | 1 57                 |   |
| 1938   | 0 68 3                 | - 0001   | 3596 1                 | 164 39       | 363 6         | 357                 | 1 71                 |   |
| 1939   | 0 734                  |  | 3960 3                 | 130 9        | 362 9         | 063                 | 09                   |   |
| *1940  | 1 6345                 |  | 43 6 5                 | 97 57        | 364 0         | 1 538               | 4                    |   |
| 1941   | 0 60                   | + 01   | 358 9                  | 63 28        | 363 3         | 1 244               | 39                   |   |
| 1942   | 1 5873                 | + 001  | 7 5 9                  | 30 76        | 364 4         | 957                 | 54                   |   |
| 1943   | 1 1787                 |  | 1091 0                 | 395 35       | 363 8         | 663                 | 69                   |   |
| *1944  | 0 7701                 |  | 1455 9                 | 361 05       | 363 1         | 369                 | 84                   |   |
| 1945   | 1 131                  |  | 182 2                  | 328 53       | 364 2         | 81                  | 99                   |   |
| 1946   | 0 7 5                  |  | 2186 6                 | 94 24        | 363 5         | 1 550               | 1 14                 | For Eclipses the argument $\gamma$ is not wanted  |
| 1947   | 0 3136                 |  | 55 8                   | 59 95        | 36 9          | 1 56                | 1 29                 |   |
| 1948   | 1 6746                 |  | 2916 9                 | 227 4        | 364 0         | 969                 | 1 44                 |   |
| 1949   | 0 657                  |  | 3 81 3                 | 193 13       | 363 3         | 674                 | 1 58                 |   |
| 1950   | 1 6269                 |  | 3647 6                 | 16 61        | 364 4         | 387                 | 1 73                 |   |
| Per od |                        |  | 4332 6                 | 398 88       | 365 3         | 1 763               | 1 77                 |   |

# SATELLITE I

## Approximate Tables of Conjunction

*I continued*

Epochs of Conjunction

| 1            | 2                   | 3                              | 4                   | 5       | 6                  | 7                | 8                 |   |
|--------------|---------------------|--------------------------------|---------------------|---------|--------------------|------------------|-------------------|---|
| Year         | Conjunction         | Variation for 100 <sup>d</sup> | $\alpha$            | $\beta$ | $\gamma$           | $\delta$         | $\epsilon$        |   |
| <b>1950</b>  | <sup>d</sup> 1'6269 | ...                            | <sup>d</sup> 3647'6 | 160'61  | <sup>d</sup> 364'4 | <sup>d</sup> 387 | <sup>d</sup> 1'73 | Column 2 corrected by the equations from the following tables, gives superior conjunction as required for Eclipses and Occultations. To find inferior conjunction for Shadows and Transits, add (or subtract) one half the synodic period, i.e. 0 <sup>d</sup> .8849, to the numbers in columns 2, 4, 5, 6, 7, 8. |
| <b>1951</b>  | 1'2182              | ...                            | 4012'5              | 126'31  | 363'7              | 093              | 11                |   |
| <b>*1952</b> | 0'8096              | ...                            | 44'8                | 92'02   | 363'1              | 1'562            | 26                |   |
| <b>1953</b>  | 1'1709              | ...                            | 411'6               | 59'50   | 364'2              | 1'275            | 41                |   |
| <b>1954</b>  | 0'7623              | ...                            | 776'4               | 25'21   | 363'5              | 0'980            | 56                |   |
| <b>1955</b>  | 0'3535              | ...                            | 1141'1              | 389'80  | 362'8              | 0'686            | 71                |   |
| <b>*1956</b> | 1'7147              | ...                            | 1507'3              | 357'27  | 364'0              | 0'399            | 86                |   |
| <b>1957</b>  | 0'3058              | ...                            | 1871'7              | 322'98  | 363'3              | 0'105            | 1'01              |   |
| <b>1958</b>  | 1'6668              | ...                            | 2237'7              | 290'46  | 364'4              | 1'580            | 1'16              |   |
| <b>1959</b>  | 1'2580              | ...                            | 2602'1              | 256'17  | 363'7              | 1'286            | 1'31              |   |
| <b>*1960</b> | 0'8492              | ...                            | 2966'6              | 221'87  | 363'0              | 0'992            | 1'45              | The constant -0 <sup>d</sup> .0333 has been applied to each of the entries in column 2.   |
| <b>1961</b>  | 1'2104              | ...                            | 3333'2              | 189'35  | 364'1              | 0'705            | 1'60              | The constant -0 <sup>d</sup> .030 has been applied to each of the entries in column 7.  |
| <b>1962</b>  | 0'8017              | ...                            | 3698'0              | 155'06  | 363'5              | 0'411            | 1'75              |   |
| <b>1963</b>  | 0'3931              | ...                            | 4062'7              | 120'76  | 362'8              | 0'116            | 1'13              |   |
| <b>*1964</b> | 1'7542              | ...                            | 96'5                | 88'24   | 363'9              | 1'592            | 28                | The constant -0 <sup>d</sup> .03 has been applied to each of the entries in column 8.   |
| <b>1965</b>  | 0'3453              | ...                            | 460'8               | 53'95   | 363'2              | 1'298            | 43                |   |
| <b>1966</b>  | 1'7064              | ...                            | 827'0               | 21'43   | 364'4              | 1'011            | 58                |   |
| <b>1967</b>  | 1'2977              | ...                            | 1191'6              | 386'02  | 363'7              | 0'717            | 73                | For Eclipses the argument $\gamma$ is not wanted.   |
| <b>*1968</b> | 0'8887              | ...                            | 1555'9              | 351'72  | 363'0              | 0'422            | 88                |   |
| <b>1969</b>  | 1'2499              | ...                            | 1922'3              | 319'20  | 364'1              | 0'135            | 1'03              |   |
| <b>1970</b>  | 0'8413              | ...                            | 2287'1              | 284'91  | 363'4              | 1'604            | 1'17              |   |
| <b>1971</b>  | 0'4326              | ...                            | 2651'9              | 250'62  | 362'8              | 1'310            | 1'32              |   |
| <b>*1972</b> | 0'0239              | ...                            | 3016'6              | 216'32  | 362'1              | 1'015            | 1'47              |   |
| <b>1973</b>  | 0'3850              | ...                            | 3383'1              | 183'80  | 363'2              | 0'728            | 1'62              |   |
| <b>1974</b>  | 1'7461              | ...                            | 3749'2              | 151'28  | 364'3              | 0'441            | 0'00              |   |
| <b>1975</b>  | 1'3372              | ...                            | 4113'5              | 116'99  | 363'6              | 0'147            | 1'15              |   |
| <b>*1976</b> | 0'9284              | ...                            | 145'3               | 82'69   | 363'0              | 1'615            | 30                |   |
| <b>1977</b>  | 1'2897              | ...                            | 512'1               | 50'17   | 364'1              | 1'328            | 45                |   |
| <b>1978</b>  | 0'8807              | ...                            | 876'0               | 15'88   | 363'4              | 1'034            | 60                |   |
| <b>1979</b>  | 0'4719              | ...                            | 1240'7              | 380'47  | 362'7              | 0'740            | 75                |   |
| <b>*1980</b> | 0'0634              | ...                            | 1605'7              | 346'18  | 362'1              | 0'446            | 90                |   |
| <b>1981</b>  | 0'4247              | ...                            | 1972'4              | 313'65  | 363'2              | 0'159            | 1'04              |   |
| <b>1982</b>  | 0'0161              | ...                            | 2337'3              | 279'36  | 362'5              | 1'627            | 1'19              |   |
| <b>1983</b>  | 1'3772              | ...                            | 2703'6              | 246'84  | 363'6              | 1'340            | 1'34              |   |
| <b>*1984</b> | 0'9682              | ...                            | 3067'6              | 212'54  | 362'9              | 1'046            | 1'49              |   |
| <b>1985</b>  | 1'3294              | - '0001                        | 3433'2              | 180'02  | 364'0              | 0'759            | 1'64              |   |
| <b>1986</b>  | 0'9199              | - '0001                        | 3796'9              | 145'73  | 363'4              | 0'464            | 0'02              |   |
| <b>1987</b>  | 0'5109              | ...                            | 4160'8              | 111'44  | 362'7              | 0'170            | 1'17              |   |
| <b>*1988</b> | 0'1021              | ...                            | 192'7               | 77'14   | 362'0              | 1'639            | 32                |   |
| <b>1989</b>  | 0'4633              | ...                            | 559'3               | 44'62   | 363'1              | 1'352            | 47                |   |
| <b>1990</b>  | 0'0547              | + '0001                        | 924'4               | 10'33   | 362'5              | 1'057            | 62                |   |
| <b>1991</b>  | 1'4162              | + '0001                        | 1291'5              | 376'69  | 363'6              | 0'770            | 77                |   |
| <b>*1992</b> | 1'0077              | + '0001                        | 1656'8              | 342'40  | 362'9              | 0'476            | 92                |   |
| <b>1993</b>  | 1'3690              | ...                            | 2023'7              | 309'87  | 364'0              | 0'189            | 1'06              |   |
| <b>1994</b>  | 0'9604              | ...                            | 2388'4              | 275'58  | 363'3              | 1'658            | 1'21              |   |
| <b>1995</b>  | 0'5516              | - '0001                        | 2752'7              | 241'29  | 362'7              | 1'363            | 1'36              |   |
| <b>*1996</b> | 0'1425              | - '0001                        | 3116'5              | 207'00  | 362'0              | 1'069            | 1'51              |   |
| <b>1997</b>  | 0'5032              | - '0001                        | 3482'1              | 174'47  | 363'1              | 0'782            | 1'66              |   |
| <b>1998</b>  | 0'0943              | - '0001                        | 3846'0              | 140'18  | 362'4              | 0'488            | 0'04              |   |
| <b>1999</b>  | 1'4552              | ...                            | 4212'0              | 107'66  | 363'5              | 0'201            | 1'19              |   |
| <b>*2000</b> | 1'0465              | ...                            | 243'9               | 73'36   | 362'9              | 1'669            | 1'34              |   |
| Period       | ...                 | ...                            | 4332'6              | 398'88  | 365'3              | 1'763            | 1'77              |   |

# SATELLITE I

## Approximate Tables of Conjunction

II

Motions of the Arguments

| Syn Rev | D te     |         | 3<br>$\alpha \beta \gamma$ | 4<br>$\delta$ | 5  | Syn Rev | Date  |         | 3<br>$\alpha \beta \gamma$ | 4<br>$\delta$ | 5  |
|---------|----------|---------|----------------------------|---------------|----|---------|-------|---------|----------------------------|---------------|----|
|         |          |         | l                          | a             | a  |         |       |         | a                          | d             | a  |
| 1       | January  | 1 7699  | 1 77                       | 007           | 00 | 53      | April | 3 8026  | 93 80                      | 378           | 04 |
| 2       |          | 3 5397  | 3 54                       | 014           | 00 | 54      |       | 5 57 5  | 95 57                      | 385           | 04 |
| 3       |          | 5 3096  | 5 31                       | 021           |    | 55      |       | 7 34 3  | 97 34                      | 39            | 04 |
| 4       |          | 7 794   | 7 8                        | 29            | 00 | 56      |       | 9 11    | 99 11                      | 399           | 04 |
| 5       |          | 8 8493  | 8 85                       | 36            | 00 | 57      |       | 10 882  | 100 88                     | 4 6           | 04 |
| 6       |          | 10 6192 | 1 62                       | 043           | 00 | 58      |       | 12 6519 | 102 65                     | 413           | 04 |
| 7       |          | 12 3890 | 1 39                       | 050           | 01 | 59      |       | 14 4 18 | 104 4                      | 421           | 04 |
| 8       |          | 14 1589 | 14 6                       | 057           | 01 | 60      |       | 16 1916 | 106 19                     | 4 8           | 4  |
| 9       |          | 15 9 87 | 15 93                      | 64            | 01 | 61      |       | 17 9615 | 107 96                     | 435           | 04 |
| 10      |          | 17 6986 | 17 7                       | 71            | 01 | 62      |       | 19 7314 | 109 73                     | 442           | 04 |
| 11      |          | 19 4685 | 19 47                      | 078           | 1  | 63      |       | 21 5012 | 111 50                     | 449           | 05 |
| 12      |          | 1 2383  | 21 24                      | 086           | 01 | 64      |       | 3 711   | 113 7                      | 456           | 05 |
| 13      |          | 3 008   | 23 01                      | 93            | 01 | 65      |       | 25 0409 | 115 04                     | 463           | 05 |
| 14      |          | 4 7780  | 4 78                       | 100           | 01 | 66      |       | 6 8108  | 116 81                     | 470           | 5  |
| 15      |          | 26 5479 | 6 55                       | 107           | 1  | 67      |       | 28 5807 | 118 58                     | 478           | 05 |
| 16      |          | 8 3178  | 8 3                        | 114           | 01 | 68      |       | 3 3505  | 1 0 35                     | 485           | 05 |
| 17      |          | 30 0876 | 30 09                      | 121           | 01 | 69      | May   | 1204    | 1 2 1                      | 492           | 05 |
| 18      |          | 31 8575 | 3 86                       | 128           | 01 | 70      |       | 3 8902  | 123 89                     | 499           | 05 |
| 19      | February | 2 6273  | 33 63                      | 135           | 01 | 71      |       | 5 6601  | 1 5 66                     | 506           | 05 |
| 20      |          | 4 3972  | 35 40                      | 143           | 01 | 72      |       | 7 4300  | 127 43                     | 513           | 05 |
| 21      |          | 6 1671  | 37 17                      | 150           | 02 | 73      |       | 9 1998  | 129 20                     | 520           | 05 |
| 22      |          | 7 9369  | 38 94                      | 157           | 02 | 74      |       | 10 9697 | 130 97                     | 5 8           | 05 |
| 23      |          | 9 7 68  | 40 71                      | 164           | 0  | 75      |       | 12 7395 | 132 74                     | 535           | 05 |
| 24      |          | 11 4767 | 42 48                      | 171           | 02 | 76      |       | 14 5094 | 134 51                     | 542           | 05 |
| 25      |          | 13 465  | 44 25                      | 178           | 2  | 77      |       | 16 2793 | 136 28                     | 549           | 06 |
| 26      |          | 15 0164 | 46 0                       | 185           | 2  | 78      |       | 18 0491 | 138 05                     | 556           | 6  |
| 27      |          | 16 786  | 47 79                      | 19            | 0  | 79      |       | 19 8190 | 139 82                     | 563           | 06 |
| 28      |          | 18 5561 | 49 56                      | 00            | 0  | 80      |       | 21 5888 | 141 59                     | 570           | 06 |
| 29      |          | 0 3 60  | 51 33                      | 7             | 0  | 81      |       | 3 3587  | 143 36                     | 577           | 06 |
| 30      |          | 22 0958 | 53 10                      | 214           | 02 | 82      |       | 25 1 86 | 145 13                     | 585           | 06 |
| 31      |          | 23 8657 | 54 87                      | 221           | 02 | 83      |       | 26 8984 | 146 90                     | 592           | 06 |
| 32      |          | 25 6355 | 56 64                      | 8             | 0  | 84      |       | 28 6683 | 148 67                     | 599           | 06 |
| 33      |          | 7 4054  | 58 41                      | 35            | 02 | 85      |       | 30 4381 | 150 44                     | 606           | 06 |
| 34      | March    | 1 1753  | 6 18                       | 242           | 02 | 86      | June  | 1 080   | 152 21                     | 613           | 06 |
| 35      |          | 2 9451  | 61 95                      | 250           | 03 | 87      |       | 2 9779  | 153 98                     | 620           | 06 |
| 36      |          | 4 7150  | 63 7                       | 57            | 03 | 88      |       | 4 7477  | 155 75                     | 627           | 06 |
| 37      |          | 6 4848  | 65 48                      | 64            | 03 | 89      |       | 6 5176  | 157 5                      | 634           | 06 |
| 38      |          | 8 547   | 67 5                       | 71            | 03 | 90      |       | 8 874   | 159 29                     | 64            | 06 |
| 39      |          | 10 246  | 69 2                       | 78            | 03 | 91      |       | 10 0573 | 161 06                     | 649           | 07 |
| 40      |          | 11 7944 | 70 79                      | 285           | 3  | 92      |       | 11 8 72 | 162 83                     | 656           | 07 |
| 41      |          | 13 5643 | 72 56                      | 29            | 03 | 93      |       | 13 5970 | 164 60                     | 663           | 07 |
| 42      |          | 15 3341 | 74 33                      | 99            | 03 | 94      |       | 15 3669 | 166 37                     | 670           | 07 |
| 43      |          | 17 1040 | 76 10                      | 307           | 03 | 95      |       | 17 1367 | 168 14                     | 677           | 07 |
| 44      |          | 18 8739 | 77 87                      | 314           | 03 | 96      |       | 18 9066 | 169 91                     | 684           | 07 |
| 45      |          | 20 6437 | 79 64                      | 321           | 3  | 97      |       | 0 6765  | 171 68                     | 691           | 07 |
| 46      |          | 4136    | 81 41                      | 328           | 03 | 98      |       | 22 4463 | 173 45                     | 699           | 07 |
| 47      |          | 4 1834  | 83 18                      | 335           | 03 | 99      |       | 4 162   | 175 22                     | 706           | 07 |
| 48      |          | 5 9533  | 84 95                      | 342           | 03 | 100     |       | 5 9860  | 176 99                     | 713           | 07 |
| 49      |          | 7 7 3   | 86 7                       | 349           | 04 | 101     |       | 27 7559 | 178 76                     | 720           | 07 |
| 50      |          | 9 493   | 88 49                      | 356           | 04 | 102     |       | 9 5258  | 180 53                     | 727           | 07 |
| 51      |          | 31 6 9  | 90 26                      | 364           | 04 | 103     | July  | 1 956   | 182 30                     | 734           | 07 |
| 52      | April    | 2 03 7  | 92 03                      | 371           | 04 | 104     |       | 3 0655  | 184 07                     | 741           | 8  |

I L p Y   l i m i t   l i t   C l m l y   f t F l 8   Th   t i t b   l d d t l   f t b l I



# SATELLITE I

## Approximate Tables of Conjunction

II continued

Motions of the Arguments

| 1         | 2         | 3                       | 4        | 5          | 1         | 2    | 3                       | 4        | 5          |       |     |
|-----------|-----------|-------------------------|----------|------------|-----------|------|-------------------------|----------|------------|-------|-----|
| Syn. Rev. | Date      | $\alpha, \beta, \gamma$ | $\delta$ | $\epsilon$ | Syn. Rev. | Date | $\alpha, \beta, \gamma$ | $\delta$ | $\epsilon$ |       |     |
|           | d         | d                       | d        | d          |           | d    | d                       | d        | d          |       |     |
| 105       | July      | 4.8354                  | 185.84   | .749       | .08       | 157  | October                 | 4.8681   | 277.87     | 1.119 | .11 |
| 106       |           | 6.6052                  | 187.61   | .756       | .08       | 158  |                         | 6.6380   | 279.64     | 1.126 | .11 |
| 107       |           | 8.3751                  | 189.38   | .763       | .08       | 159  |                         | 8.4078   | 281.41     | 1.133 | .11 |
| 108       |           | 10.1449                 | 191.14   | .770       | .08       | 160  |                         | 10.1777  | 283.18     | 1.141 | .12 |
| 109       |           | 11.9148                 | 192.91   | .777       | .08       | 161  |                         | 11.9475  | 284.95     | 1.148 | .12 |
| 110       |           | 13.6847                 | 194.68   | .784       | .08       | 162  |                         | 13.7174  | 286.72     | 1.155 | .12 |
| 111       |           | 15.4545                 | 196.45   | .791       | .08       | 163  |                         | 15.4873  | 288.49     | 1.162 | .12 |
| 112       |           | 17.2244                 | 198.22   | .798       | .08       | 164  |                         | 17.2571  | 290.26     | 1.169 | .12 |
| 113       |           | 18.9942                 | 199.99   | .806       | .08       | 165  |                         | 19.0270  | 292.03     | 1.176 | .12 |
| 114       |           | 20.7641                 | 201.76   | .813       | .08       | 166  |                         | 20.7968  | 293.80     | 1.183 | .12 |
| 115       |           | 22.5340                 | 203.53   | .820       | .08       | 167  |                         | 22.5667  | 295.57     | 1.190 | .12 |
| 116       |           | 24.3038                 | 205.30   | .827       | .08       | 168  |                         | 24.3366  | 297.34     | 1.198 | .12 |
| 117       |           | 26.0737                 | 207.07   | .834       | .08       | 169  |                         | 26.1064  | 299.11     | 1.205 | .12 |
| 118       |           | 27.8435                 | 208.84   | .841       | .09       | 170  |                         | 27.8763  | 300.88     | 1.212 | .12 |
| 119       |           | 29.6134                 | 210.61   | .848       | .09       | 171  |                         | 29.6461  | 302.65     | 1.219 | .12 |
| 120       |           | 31.3833                 | 212.38   | .855       | .09       | 172  |                         | 31.4160  | 304.42     | 1.226 | .12 |
| 121       | August    | 2.1531                  | 214.15   | .863       | .09       | 173  | November                | 2.1859   | 306.19     | 1.233 | .12 |
| 122       |           | 3.9230                  | 215.92   | .870       | .09       | 174  |                         | 3.9557   | 307.96     | 1.240 | .13 |
| 123       |           | 5.6928                  | 217.69   | .877       | .09       | 175  |                         | 5.7256   | 309.73     | 1.248 | .13 |
| 124       |           | 7.4627                  | 219.46   | .884       | .09       | 176  |                         | 7.4954   | 311.50     | 1.255 | .13 |
| 125       |           | 9.2326                  | 221.23   | .891       | .09       | 177  |                         | 9.2653   | 313.27     | 1.262 | .13 |
| 126       |           | 11.0024                 | 223.00   | .898       | .09       | 178  |                         | 11.0352  | 315.04     | 1.269 | .13 |
| 127       |           | 12.7723                 | 224.77   | .905       | .09       | 179  |                         | 12.8050  | 316.81     | 1.276 | .13 |
| 128       |           | 14.5421                 | 226.54   | .912       | .09       | 180  |                         | 14.5749  | 318.57     | 1.283 | .13 |
| 129       |           | 16.3120                 | 228.31   | .920       | .09       | 181  |                         | 16.3447  | 320.34     | 1.290 | .13 |
| 130       |           | 18.0819                 | 230.08   | .927       | .09       | 182  |                         | 18.1146  | 322.11     | 1.297 | .13 |
| 131       |           | 19.8517                 | 231.85   | .934       | .10       | 183  |                         | 19.8845  | 323.88     | 1.305 | .13 |
| 132       |           | 21.6216                 | 233.62   | .941       | .10       | 184  |                         | 21.6543  | 325.65     | 1.312 | .13 |
| 133       |           | 23.3914                 | 235.39   | .948       | .10       | 185  |                         | 23.4242  | 327.42     | 1.319 | .13 |
| 134       |           | 25.1613                 | 237.16   | .955       | .10       | 186  |                         | 25.1941  | 329.19     | 1.326 | .13 |
| 135       |           | 26.9312                 | 238.93   | .962       | .10       | 187  |                         | 26.9639  | 330.96     | 1.333 | .14 |
| 136       |           | 28.7010                 | 240.70   | .970       | .10       | 188  |                         | 28.7338  | 332.73     | 1.340 | .14 |
| 137       |           | 30.4709                 | 242.47   | .977       | .10       | 189  |                         | 30.5036  | 334.50     | 1.347 | .14 |
| 138       | September | 1.2407                  | 244.24   | .984       | .10       | 190  | December                | 2.2735   | 336.27     | 1.354 | .14 |
| 139       |           | 3.0106                  | 246.01   | .991       | .10       | 191  |                         | 4.0434   | 338.04     | 1.362 | .14 |
| 140       |           | 4.7805                  | 247.78   | .998       | .10       | 192  |                         | 5.8132   | 339.81     | 1.369 | .14 |
| 141       |           | 6.5503                  | 249.55   | 1.005      | .10       | 193  |                         | 7.5831   | 341.58     | 1.376 | .14 |
| 142       |           | 8.3202                  | 251.32   | 1.012      | .10       | 194  |                         | 9.3529   | 343.35     | 1.383 | .14 |
| 143       |           | 10.0901                 | 253.09   | 1.019      | .10       | 195  |                         | 11.1228  | 345.12     | 1.390 | .14 |
| 144       |           | 11.8599                 | 254.86   | 1.027      | .10       | 196  |                         | 12.8927  | 346.89     | 1.397 | .14 |
| 145       |           | 13.6298                 | 256.63   | 1.034      | .10       | 197  |                         | 14.6625  | 348.66     | 1.404 | .14 |
| 146       |           | 15.3996                 | 258.40   | 1.041      | .11       | 198  |                         | 16.4324  | 350.43     | 1.411 | .14 |
| 147       |           | 17.1695                 | 260.17   | 1.048      | .11       | 199  |                         | 18.2022  | 352.20     | 1.419 | .14 |
| 148       |           | 18.9394                 | 261.94   | 1.055      | .11       | 200  |                         | 19.9721  | 353.97     | 1.426 | .14 |
| 149       |           | 20.7092                 | 263.71   | 1.062      | .11       | 201  |                         | 21.7420  | 355.74     | 1.433 | .15 |
| 150       |           | 22.4791                 | 265.48   | 1.069      | .11       | 202  |                         | 23.5118  | 357.51     | 1.440 | .15 |
| 151       |           | 24.2489                 | 267.25   | 1.076      | .11       | 203  |                         | 25.2817  | 359.28     | 1.447 | .15 |
| 152       |           | 26.0188                 | 269.02   | 1.084      | .11       | 204  |                         | 27.0515  | 361.05     | 1.454 | .15 |
| 153       |           | 27.7887                 | 270.79   | 1.091      | .11       | 205  |                         | 28.8214  | 362.82     | 1.461 | .15 |
| 154       |           | 29.5585                 | 272.56   | 1.098      | .11       | 206  |                         | 30.5913  | 364.59     | 1.469 | .15 |
| 155       | October   | 1.3284                  | 274.33   | 1.105      | .11       | 207  |                         | 32.3611  | 366.36     | 1.476 | .15 |
| 156       |           | 3.0982                  | 276.10   | 1.112      | .11       |      |                         |          |            |       |     |

In Leap Year, diminish the date in Column 2 by 1 day.

In Leap Year, diminish the date in Column 2 by  $x^4$  after Feb. 28.

The entries to be added to those of Table I.

# SATELLITE I

## Approximate Tables of Conjunction

III      Equation of Conjunction      Argument  $a$       Ec, Oc, Sh, Tr

| $a$  | Equation | $\Delta_o$ | $a$  | Equation | $\Delta_o$ | $a$  | Equation | $\Delta_o$ | $a$  | Equation | $\Delta_o$ | $a$  | Equation | $\Delta_o$ |
|------|----------|------------|------|----------|------------|------|----------|------------|------|----------|------------|------|----------|------------|
| 0    | 0030     | +4         | 1000 | 057      | +03        | 2000 | 00361    | 35         | 3000 | 0051     | -15        | 4000 | 167      | +35        |
| 20   | 308      | 4          | 1020 | 572      | 00         | 2020 | 354      | 35         | 3020 | 48       | 15         | 4020 | 174      | 38         |
| 40   | 317      | 42         | 1040 | 57       | 00         | 2040 | 347      | 38         | 3040 | 45       | 13         | 4040 | 18       | 38         |
| 60   | 35       | 40         | 1060 | 57       | 0          | 2060 | 339      | 38         | 3060 | 43       | 13         | 4060 | 189      | 38         |
| 80   | 333      | 4          | 1080 | 572      | -03        | 2080 | 332      | 35         | 3080 | 40       | 13         | 4080 | 197      | 40         |
| 100  | 342      | 4          | 1100 | 57       | 03         | 2100 | 35       | 38         | 3100 | 38       | 10         | 4100 | 05       | 40         |
| 120  | 35       | +40        | 1120 | 0571     | -03        | 2120 | 00317    | -38        | 3120 | 0036     | -1         | 4120 | 0213     | +40        |
| 140  | 358      | 40         | 1140 | 570      | 05         | 2140 | 310      | 38         | 3140 | 34       | 10         | 4140 | 1        | 4          |
| 160  | 366      | 40         | 1160 | 569      | 8          | 2160 | 30       | 38         | 3160 | 32       | 8          | 4160 | 9        | 40         |
| 180  | 374      | 40         | 1180 | 567      | 10         | 2180 | 95       | 35         | 3180 | 31       | 05         | 4180 | 37       | 40         |
| 200  | 38       | 40         | 1200 | 565      | 10         | 2200 | 88       | 38         | 3200 | 30       | 05         | 4200 | 45       | 40         |
| 220  | 0039     | +4         | 1220 | 0563     | -10        | 2220 | 00280    | -38        | 3220 | 009      | -05        | 4220 | 00253    | +40        |
| 240  | 398      | 4          | 1240 | 561      | 10         | 2240 | 273      | 38         | 3240 | 28       | -03        | 4240 | 61       | 43         |
| 260  | 46       | 38         | 1260 | 559      | 10         | 2260 | 65       | 38         | 3260 | 8        | 0          | 4260 | 70       | 43         |
| 280  | 413      | 38         | 1280 | 557      | 13         | 2280 | 58       | 35         | 3280 | 8        | 0          | 4280 | 78       | 4          |
| 300  | 421      | 38         | 1300 | 554      | 15         | 2300 | 51       | 36         | 3300 | 28       | 00         | 4300 | 86       | 43         |
| 320  | 00428    | +38        | 1320 | 0551     | -15        | 2320 | 00243    | 38         | 3320 | 00028    | 00         | 4320 | 0295     | +43        |
| 340  | 436      | 38         | 1340 | 548      | 18         | 2340 | 36       | 35         | 3340 | 8        | +03        | 4340 | 33       | 40         |
| 360  | 443      | 35         | 1360 | 544      | 18         | 2360 | 29       | 35         | 3360 | 9        | 05         | 4360 | 311      | 43         |
| 380  | 450      | 35         | 1380 | 541      | 18         | 2380 | 22       | 35         | 3380 | 30       | 05         | 4380 | 320      | 43         |
| 400  | 457      | 33         | 1400 | 537      | 0          | 2400 | 215      | 35         | 3400 | 31       | 05         | 4400 | 328      | 4          |
| 420  | 00463    | +33        | 1420 | 0533     | -20        | 2420 | 0208     | -35        | 3420 | 00032    | +08        | 4420 | 00336    | +43        |
| 440  | 470      | 33         | 1440 | 529      |            | 2440 | 201      | 35         | 3440 | 34       | 10         | 4440 | 345      | 43         |
| 460  | 476      | 30         | 1460 | 55       | 2          | 2460 | 194      | 35         | 3460 | 36       | 1          | 4460 | 353      | 40         |
| 480  | 48       | 30         | 1480 | 51       | 23         | 2480 | 187      | 35         | 3480 | 38       | 1          | 4480 | 361      | 40         |
| 500  | 488      | 30         | 1500 | 516      | 5          | 2500 | 180      | 33         | 3500 | 40       | 13         | 4500 | 369      | 40         |
| 520  | 00494    | +30        | 1520 | 0511     | -5         | 2520 | 0174     | 33         | 3520 | 00043    | +15        | 4520 | 00377    | +40        |
| 540  | 5        | 30         | 1540 | 506      | 5          | 2540 | 167      | 35         | 3540 | 46       | 15         | 4540 | 385      | 4          |
| 560  | 506      | 8          | 1560 | 501      | 5          | 2560 | 16       | 33         | 3560 | 49       | 15         | 4560 | 393      | 40         |
| 580  | 511      | 5          | 1580 | 496      | 5          | 2580 | 154      | 30         | 3580 | 52       | 15         | 4580 | 401      | 40         |
| 600  | 516      | 5          | 1600 | 491      | 28         | 2600 | 148      | 30         | 3600 | 55       | 18         | 4600 | 409      | 38         |
| 620  | 0051     | +5         | 1620 | 0485     | -8         | 2620 | 00142    | -30        | 3620 | 00059    | +0         | 4620 | 00416    | +38        |
| 640  | 56       | 3          | 1640 | 480      | 28         | 2640 | 136      | 30         | 3640 | 63       | 20         | 4640 | 44       | 38         |
| 660  | 530      |            | 1660 | 474      | 30         | 2660 | 130      | 30         | 3660 | 67       | 23         | 4660 | 431      | 35         |
| 680  | 534      | 0          | 1680 | 468      | 30         | 2680 | 124      | 30         | 3680 | 72       | 3          | 4680 | 438      | 35         |
| 700  | 538      | 0          | 1700 | 46       | 3          | 2700 | 118      | 8          | 3700 | 76       | 23         | 4700 | 445      | 35         |
| 720  | 00542    | +20        | 1720 | 0456     | -30        | 2720 | 00113    | -8         | 3720 | 00081    | +25        | 4720 | 045      | +35        |
| 740  | 546      | 18         | 1740 | 450      | 30         | 2740 | 17       | 8          | 3740 | 86       | 25         | 4740 | 459      | 35         |
| 760  | 549      | 15         | 1760 | 444      | 33         | 2760 | 12       | 25         | 3760 | 91       | 25         | 4760 | 466      | 33         |
| 780  | 55       | 15         | 1780 | 437      | 33         | 2780 | 97       | 5          | 3780 | 96       | 8          | 4780 | 47       | 33         |
| 800  | 555      | 15         | 1800 | 431      | 33         | 2800 | 9        | 5          | 3800 | 1        | 3          | 4800 | 479      | 33         |
| 820  | 558      | +15        | 1820 | 044      | -35        | 2820 | 087      | -25        | 3820 | 0108     | +3         | 4820 | 0485     | +30        |
| 840  | 561      | 13         | 1840 | 417      | 35         | 2840 | 82       | 3          | 3840 | 114      | 30         | 4840 | 491      | 30         |
| 860  | 563      | 1          | 1860 | 410      | 33         | 2860 | 78       | 3          | 3860 | 10       | 30         | 4860 | 497      | 28         |
| 880  | 565      | 1          | 1880 | 404      | 33         | 2880 | 73       | 23         | 3880 | 16       | 33         | 4880 | 50       | 28         |
| 900  | 567      | 08         | 1900 | 397      | 35         | 2900 | 69       | 0          | 3900 | 133      | 33         | 4900 | 58       | 28         |
| 920  | 0568     | +05        | 1920 | 0390     | -35        | 2920 | 0065     | -20        | 3920 | 00139    | +33        | 4920 | 00513    | +25        |
| 940  | 569      | 05         | 1940 | 383      | 35         | 2940 | 61       | 18         | 3940 | 146      | 35         | 4940 | 518      | 25         |
| 960  | 570      | 05         | 1960 | 376      | 38         | 2960 | 58       | 18         | 3960 | 153      | 35         | 4960 | 523      | 3          |
| 980  | 571      | 05         | 1980 | 368      | 38         | 2980 | 54       | 18         | 3980 | 160      | 35         | 4980 | 527      | 23         |
| 1000 | 0057     | +03        | 2000 | 0361     | -35        | 3000 | 00051    | -15        | 4000 | 00167    | +35        | 5000 | 00532    | +3         |

# SATELLITE I

## Approximate Tables of Conjunction

| IV      |          |               | Equation for Geocentric Conjunction |          |               | Argument $\beta$ |          |               | Oc., Tr. |          |               |
|---------|----------|---------------|-------------------------------------|----------|---------------|------------------|----------|---------------|----------|----------|---------------|
| 1       | 2        | 3             | 1                                   | 2        | 3             | 1                | 2        | 3             | 1        | 2        | 3             |
| $\beta$ | Equation | $\Delta_{Td}$ | $\beta$                             | Equation | $\Delta_{Td}$ | $\beta$          | Equation | $\Delta_{Td}$ | $\beta$  | Equation | $\Delta_{Td}$ |
| d       | d        |               | d                                   | d        |               | d                | d        |               | d        | d        |               |
| 0       | -0°0100  | - 11          | 100                                 | -0°0635  | + 2           | 200              | -0°0096  | + 7           | 300      | +0°0436  | + 1           |
| 2       | 121      | 10            | 102                                 | 632      | 2             | 202              | 82       | 7             | 302      | 439      | 1             |
| 4       | 142      | 11            | 104                                 | 628      | 2             | 204              | 67       | 7             | 304      | 441      | 1             |
| 6       | 163      | 10            | 106                                 | 623      | 2             | 206              | 53       | 7             | 306      | 443      | + 1           |
| 8       | 184      | 11            | 108                                 | 619      | 2             | 208              | 39       | 7             | 308      | 444      | 0             |
| 10      | 205      | 10            | 110                                 | 614      | 3             | 210              | 25       | 7             | 310      | 444      | 0             |
| 12      | -0°0225  | - 10          | 112                                 | -0°0608  | + 3           | 212              | -0°0010  | + 7           | 312      | +0°0444  | 0             |
| 14      | 246      | 10            | 114                                 | 602      | 3             | 214              | + 4      | 7             | 314      | 444      | 0             |
| 16      | 266      | 10            | 116                                 | 596      | 3             | 216              | 18       | 7             | 316      | 443      | - 1           |
| 18      | 286      | 10            | 118                                 | 589      | 4             | 218              | 32       | 7             | 318      | 441      | 1             |
| 20      | 305      | 10            | 120                                 | 582      | 4             | 220              | 46       | 7             | 320      | 439      | 1             |
| 22      | -0°0324  | - 9           | 122                                 | -0°0574  | + 4           | 222              | +0°0060  | + 7           | 322      | +0°0436  | - 2           |
| 24      | 343      | 9             | 124                                 | 566      | 4             | 224              | 74       | 7             | 324      | 433      | 2             |
| 26      | 361      | 9             | 126                                 | 558      | 4             | 226              | 87       | 7             | 326      | 429      | 2             |
| 28      | 379      | 9             | 128                                 | 549      | 4             | 228              | 101      | 7             | 328      | 425      | 2             |
| 30      | 397      | 9             | 130                                 | 540      | 5             | 230              | 114      | 7             | 330      | 420      | 3             |
| 32      | -0°0413  | - 8           | 132                                 | -0°0531  | + 5           | 232              | +0°0128  | + 7           | 332      | +0°0414  | - 3           |
| 34      | 430      | 8             | 134                                 | 521      | 5             | 234              | 141      | 7             | 334      | 407      | 4             |
| 36      | 446      | 8             | 136                                 | 511      | 5             | 236              | 154      | 6             | 336      | 400      | 3             |
| 38      | 461      | 8             | 138                                 | 501      | 5             | 238              | 167      | 7             | 338      | 393      | 4             |
| 40      | 476      | 7             | 140                                 | 491      | 5             | 240              | 180      | 6             | 340      | 385      | 4             |
| 42      | -0°0490  | - 7           | 142                                 | -0°0480  | + 5           | 242              | +0°0193  | + 6           | 342      | +0°0376  | - 5           |
| 44      | 503      | 7             | 144                                 | 469      | 6             | 244              | 205      | 6             | 344      | 366      | 5             |
| 46      | 516      | 6             | 146                                 | 458      | 6             | 246              | 217      | 6             | 346      | 356      | 5             |
| 48      | 529      | 6             | 148                                 | 446      | 6             | 248              | 229      | 6             | 348      | 345      | 6             |
| 50      | 540      | 6             | 150                                 | 435      | 6             | 250              | 241      | 6             | 350      | 334      | 6             |
| 52      | -0°0551  | - 5           | 152                                 | -0°0423  | + 6           | 252              | +0°0253  | + 6           | 352      | +0°0322  | - 6           |
| 54      | 562      | 5             | 154                                 | 411      | 6             | 254              | 264      | 6             | 354      | 309      | 7             |
| 56      | 572      | 5             | 156                                 | 398      | 6             | 256              | 275      | 5             | 356      | 296      | 7             |
| 58      | 581      | 4             | 158                                 | 386      | 6             | 258              | 286      | 6             | 358      | 282      | 7             |
| 60      | 589      | 4             | 160                                 | 373      | 6             | 260              | 297      | 5             | 360      | 267      | 8             |
| 62      | -0°0597  | - 4           | 162                                 | -0°0360  | + 7           | 262              | +0°0307  | + 5           | 362      | +0°0252  | - 7           |
| 64      | 604      | 4             | 164                                 | 347      | 6             | 264              | 317      | 5             | 364      | 237      | 8             |
| 66      | 611      | 3             | 166                                 | 334      | 7             | 266              | 327      | 5             | 366      | 221      | 8             |
| 68      | 617      | 3             | 168                                 | 321      | 7             | 268              | 336      | 5             | 368      | 204      | 9             |
| 70      | 622      | 3             | 170                                 | 307      | 7             | 270              | 345      | 4             | 370      | 187      | 9             |
| 72      | -0°0627  | - 2           | 172                                 | -0°0293  | + 7           | 272              | +0°0354  | + 5           | 372      | +0°0169  | - 9           |
| 74      | 631      | 2             | 174                                 | 280      | 7             | 274              | 363      | 4             | 374      | 151      | 9             |
| 76      | 635      | 2             | 176                                 | 266      | 7             | 276              | 371      | 4             | 376      | 133      | 9             |
| 78      | 638      | 1             | 178                                 | 252      | 7             | 278              | 378      | 4             | 378      | 114      | 10            |
| 80      | 640      | 1             | 180                                 | 238      | 7             | 280              | 386      | 4             | 380      | 94       | 10            |
| 82      | -0°0642  | - 1           | 182                                 | -0°0224  | + 7           | 282              | +0°0393  | + 4           | 382      | +0°0075  | - 10          |
| 84      | 643      | - 1           | 184                                 | 210      | 7             | 284              | 399      | 3             | 384      | 55       | 10            |
| 86      | 644      | 0             | 186                                 | 196      | 7             | 286              | 405      | 3             | 386      | 35       | 10            |
| 88      | 645      | 0             | 188                                 | 182      | 7             | 288              | 411      | 3             | 388      | + 14     | 10            |
| 90      | 644      | 0             | 190                                 | 168      | 7             | 290              | 416      | 3             | 390      | - 7      | 10            |
| 92      | -0°0643  | + 1           | 192                                 | -0°0153  | + 7           | 292              | +0°0421  | + 2           | 392      | -0°0027  | - 10          |
| 94      | 642      | 1             | 194                                 | 139      | 7             | 294              | 426      | 2             | 394      | 48       | 11            |
| 96      | 640      | 1             | 196                                 | 125      | 7             | 296              | 430      | 2             | 396      | 69       | 10            |
| 98      | 638      | 1             | 198                                 | 110      | 7             | 298              | 433      | 2             | 398      | 91       | 11            |
| 100     | -0°0635  | + 2           | 200                                 | -0°0096  | + 7           | 300              | +0°0436  | + 1           | 400      | -0°0111  | - 10          |

Applied Constant : -0° 0100.

The Equation of Table IV, corrected by those of Tables V, VI, gives the Annual Parallax,  $p$ , which must be applied for Occultations and Transits to the entries in Columns 2, 7, 8. of Table I, and also serves as argument of Table LI for computing the effect of Jupiter's phase.

# SATELLITE I

## Approximate Tables of Conjunction

V      Equation for Geocentric Conjunction      Arguments  $\alpha, \beta$       Oc, Tr

| $\alpha \backslash \beta$ | 0 <sup>d</sup> | 20 <sup>d</sup> | 40 <sup>d</sup> | 60 <sup>d</sup> | 80 <sup>d</sup> | 100 <sup>d</sup> | 120 <sup>d</sup> | 140 <sup>d</sup> | 160 <sup>d</sup> | 180 <sup>d</sup> | 200 <sup>d</sup> | 220 <sup>d</sup> | 240 <sup>l</sup> | 260 <sup>d</sup> | 280 <sup>l</sup> | 300 <sup>l</sup> | 320 <sup>l</sup> | 340 <sup>d</sup> | 360 <sup>l</sup> | 380 <sup>d</sup> | 400 <sup>d</sup> |
|---------------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0                         | 70             | 58              | 48              | 42              | 41              | 43               | 48               | 54               | 6                | 65               | 70               | 75               | 80               | 87               | 9                | 97               | 99               | 97               | 91               | 81               | 69               |
| 100                       | 79             | 66              | 55              | 47              | 4               | 4                | 45               | 49               | 54               | 59               | 64               | 69               | 75               | 8                | 89               | 96               | 10               | 10               | 98               | 89               | 78               |
| 200                       | 88             | 75              | 6               | 51              | 44              | 4                | 42               | 45               | 49               | 54               | 58               | 63               | 69               | 76               | 85               | 93               | 101              | 104              | 103              | 97               | 87               |
| 300                       | 96             | 83              | 69              | 57              | 47              | 41               | 40               | 41               | 44               | 48               | 5                | 57               | 63               | 71               | 80               | 91               | 1                | 17               | 109              | 15               | 95               |
| 400                       | 14             | 92              | 77              | 6               | 5               | 4                | 38               | 38               | 40               | 43               | 47               | 51               | 57               | 66               | 76               | 88               | 99               | 108              | 113              | 11               | 13               |
| 500                       | 111            | 99              | 84              | 68              | 53              | 43               | 37               | 35               | 36               | 39               | 4                | 46               | 5                | 60               | 71               | 84               | 98               | 19               | 116              | 117              | 111              |
| 600                       | 117            | 106             | 91              | 73              | 57              | 45               | 37               | 34               | 33               | 35               | 38               | 41               | 47               | 55               | 66               | 81               | 96               | 19               | 119              | 12               | 117              |
| 700                       | 123            | 13              | 97              | 79              | 61              | 47               | 38               | 33               | 31               | 3                | 34               | 37               | 4                | 5                | 6                | 77               | 93               | 109              | 10               | 15               | 12               |
| 800                       | 17             | 118             | 13              | 84              | 66              | 50               | 39               | 33               | 3                | 3                | 31               | 34               | 38               | 46               | 57               | 73               | 9                | 17               | 11               | 128              | 127              |
| 900                       | 130            | 122             | 18              | 89              | 70              | 53               | 41               | 33               | 9                | 9                | 9                | 31               | 35               | 4                | 53               | 68               | 86               | 105              | 10               | 19               | 130              |
| 1000                      | 13             | 16              | 11              | 94              | 74              | 57               | 43               | 34               | 3                | 28               | 8                | 9                | 33               | 39               | 49               | 64               | 8                | 102              | 118              | 19               | 131              |
| 1100                      | 13             | 18              | 116             | 98              | 79              | 61               | 46               | 37               | 31               | 8                | 8                | 28               | 31               | 36               | 46               | 6                | 78               | 98               | 116              | 18               | 132              |
| 1200                      | 13             | 19              | 118             | 12              | 83              | 65               | 5                | 39               | 33               | 3                | 28               | 8                | 30               | 34               | 43               | 56               | 74               | 94               | 11               | 15               | 131              |
| 1300                      | 129            | 18              | 119             | 105             | 87              | 69               | 54               | 43               | 36               | 32               | 30               | 9                | 3                | 33               | 41               | 53               | 70               | 89               | 107              | 1                | 129              |
| 1400                      | 125            | 17              | 10              | 107             | 90              | 73               | 58               | 47               | 39               | 35               | 3                | 30               | 30               | 33               | 39               | 5                | 65               | 83               | 10               | 117              | 126              |
| 1500                      | 11             | 14              | 119             | 108             | 93              | 77               | 63               | 51               | 43               | 38               | 35               | 33               | 32               | 33               | 38               | 47               | 61               | 78               | 96               | 111              | 11               |
| 1600                      | 115            | 120             | 118             | 19              | 96              | 81               | 67               | 56               | 48               | 43               | 39               | 36               | 34               | 34               | 37               | 45               | 57               | 7                | 89               | 105              | 116              |
| 1700                      | 109            | 115             | 115             | 9               | 98              | 85               | 7                | 61               | 5                | 48               | 43               | 40               | 37               | 36               | 38               | 43               | 53               | 67               | 8                | 98               | 109              |
| 1800                      | 101            | 19              | 111             | 18              | 99              | 88               | 77               | 67               | 59               | 53               | 48               | 45               | 41               | 39               | 39               | 4                | 49               | 61               | 75               | 90               | 102              |
| 1900                      | 93             | 103             | 107             | 16              | 100             | 91               | 81               | 7                | 66               | 59               | 54               | 5                | 46               | 4                | 4                | 41               | 46               | 55               | 68               | 81               | 94               |
| 2000                      | 85             | 95              | 102             | 13              | 10              | 94               | 86               | 78               | 70               | 65               | 60               | 55               | 5                | 46               | 4                | 41               | 44               | 5                | 6                | 73               | 85               |
| 2100                      | 76             | 87              | 96              |                 | 10              | 96               | 90               | 83               | 76               | 71               | 66               | 61               | 56               | 5                | 45               | 4                | 4                | 46               | 53               | 64               | 77               |
| 2200                      | 67             | 79              | 89              | 96              | 99              | 97               | 93               | 88               | 8                | 77               | 7                | 67               | 61               | 55               | 49               | 43               | 40               | 41               | 47               | 56               | 68               |
| 2300                      | 58             | 7               | 8               | 9               | 97              | 98               | 96               | 92               | 87               | 83               | 78               | 73               | 67               | 60               | 53               | 45               | 4                | 38               | 40               | 48               | 59               |
| 2400                      | 49             | 62              | 75              | 87              | 95              | 99               | 99               | 96               | 93               | 88               | 84               | 79               | 73               | 65               | 57               | 47               | 39               | 35               | 35               | 40               | 50               |
| 2500                      | 41             | 54              | 68              | 8               | 9               | 99               | 101              | 100              | 97               | 94               | 90               | 85               | 79               | 71               | 61               | 50               | 40               | 33               | 3                | 33               | 4                |
| 2600                      | 34             | 46              | 61              | 76              | 89              | 98               | 1                | 103              | 101              | 98               | 95               | 90               | 84               | 76               | 66               | 53               | 41               | 31               | 26               | 7                | 34               |
| 2700                      | 7              | 38              | 54              | 71              | 85              | 96               | 13               | 105              | 105              | 10               | 99               | 96               | 90               | 81               | 70               | 57               | 43               | 31               | 3                | 1                | 7                |
| 2800                      | 21             | 3               | 47              | 65              | 81              | 94               | 103              | 17               | 17               | 106              | 104              | 100              | 95               | 87               | 75               | 61               | 45               | 31               | 1                | 17               | 1                |
| 2900                      | 16             | 5               | 41              | 59              | 77              | 92               | 10               | 17               | 19               | 19               | 107              | 104              | 99               | 91               | 8                | 65               | 48               | 3                | 0                | 14               | 16               |
| 3000                      | 1              |                 | 35              | 54              | 73              | 89               | 11               | 107              | 11               | 111              | 110              | 107              | 103              | 95               | 84               | 69               | 51               | 34               | 0                | 12               | 1                |
| 3100                      | 9              | 16              | 31              | 49              | 69              | 86               | 99               | 107              | 111              | 1                | 111              | 110              | 106              | 99               | 88               | 73               | 55               | 36               | 1                | 11               | 10               |
| 3200                      | 8              | 14              | 27              | 45              | 64              | 8                | 96               | 15               | 11               | 11               | 11               | 111              | 108              | 10               | 9                | 77               | 59               | 40               | 3                | 11               | 8                |
| 3300                      | 8              | 1               | 3               | 41              | 60              | 78               | 93               | 103              | 19               | 111              | 11               | 1                | 110              | 105              | 95               | 81               | 63               | 44               | 6                | 13               | 8                |
| 3400                      | 9              | 1               | 21              | 37              | 56              | 74               | 89               | 10               | 16               | 110              | 111              | 11               | 110              | 16               | 98               | 85               | 67               | 48               | 30               | 16               | 9                |
| 3500                      | 1              | 1               | 0               | 35              | 5               | 70               | 85               | 96               | 103              | 17               | 11               | 111              | 11               | 107              | 10               | 88               | 7                | 53               | 34               | 20               | 1                |
| 3600                      | 16             | 14              | 0               | 33              | 49              | 66               | 80               | 9                | 10               | 104              | 107              | 109              | 109              | 107              | 10               | 91               | 76               | 58               | 40               | 25               | 16               |
| 3700                      | 1              | 17              | 1               | 3               | 46              | 6                | 76               | 87               | 95               | 10               | 104              | 106              | 107              | 16               | 10               | 94               | 81               | 64               | 46               | 31               | 0                |
| 3800                      | 27             | 21              | 3               | 31              | 44              | 58               | 71               | 82               | 9                | 96               | 10               | 103              | 105              | 105              | 13               | 96               | 85               | 70               | 53               | 38               | 6                |
| 3900                      | 34             | 7               | 6               | 3               | 4               | 54               | 66               | 77               | 85               | 91               | 95               | 98               | 101              | 13               | 1                | 97               | 88               | 75               | 6                | 45               | 33               |
| 4000                      | 41             | 33              | 30              | 33              | 4               | 51               | 6                | 71               | 79               | 85               | 9                | 94               | 97               | 10               | 11               | 98               | 9                | 81               | 67               | 53               | 41               |
| 4100                      | 49             | 40              | 35              | 35              | 40              | 48               | 57               | 66               | 74               | 79               | 84               | 88               | 93               | 97               | 99               | 99               | 95               | 86               | 75               | 61               | 49               |
| 4200                      | 58             | 47              | 40              | 38              | 40              | 45               | 53               | 61               | 68               | 73               | 78               | 83               | 88               | 93               | 97               | 98               | 97               | 91               | 82               | 70               | 58               |
| 4300                      | 67             | 55              | 46              | 4               | 40              | 44               | 49               | 55               | 62               | 67               | 7                | 77               | 82               | 88               | 94               | 98               | 99               | 96               | 89               | 79               | 66               |
| 4400                      | 76             | 64              | 53              | 45              | 4               | 4                | 46               | 51               | 56               | 61               | 66               | 71               | 77               | 83               | 90               | 96               | 100              | 100              | 96               | 87               | 75               |
| 4500                      | 85             | 72              | 6               | 50              | 44              | 41               | 43               | 46               | 51               | 55               | 60               | 65               | 71               | 78               | 86               | 94               | 101              | 13               | 10               | 95               | 84               |

Th it tli T bl q l

Appl d O t t +

Th ti p it

Th Eq t fli T bl t b dd dt th t f T bl IV

# SATELLITE I

## Approximate Tables of Conjunction

VI      Equation for Geocentric Conjunction      Arguments  $\beta, \gamma$       Oc., Tr.

| $\gamma \backslash \beta$ | 0 <sup>d</sup> | 20 <sup>d</sup> | 40 <sup>d</sup> | 60 <sup>d</sup> | 80 <sup>d</sup> | 100 <sup>d</sup> | 120 <sup>d</sup> | 140 <sup>d</sup> | 160 <sup>d</sup> | 180 <sup>d</sup> | 200 <sup>d</sup> | 220 <sup>d</sup> | 240 <sup>d</sup> | 260 <sup>d</sup> | 280 <sup>d</sup> | 300 <sup>d</sup> | 320 <sup>d</sup> | 340 <sup>d</sup> | 360 <sup>d</sup> | 380 <sup>d</sup> | 400 <sup>d</sup> |
|---------------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0                         | 30             | 34              | 37              | 39              | 40              | 39               | 38               | 36               | 34               | 32               | 30               | 28               | 26               | 24               | 22               | 21               | 20               | 21               | 23               | 26               | 30               |
| 20                        | 23             | 27              | 31              | 36              | 39              | 40               | 40               | 39               | 38               | 37               | 35               | 33               | 31               | 29               | 25               | 22               | 19               | 18               | 18               | 19               | 23               |
| 40                        | 16             | 20              | 25              | 31              | 36              | 39               | 41               | 42               | 42               | 41               | 40               | 38               | 36               | 33               | 29               | 25               | 20               | 16               | 14               | 14               | 16               |
| 60                        | 11             | 14              | 20              | 26              | 33              | 38               | 41               | 43               | 44               | 44               | 43               | 42               | 40               | 37               | 33               | 28               | 22               | 16               | 12               | 10               | 11               |
| 80                        | 8              | 11              | 16              | 22              | 29              | 35               | 40               | 43               | 45               | 45               | 45               | 44               | 43               | 41               | 37               | 31               | 25               | 18               | 12               | 9                | 10               |
| 100                       | 8              | 9               | 13              | 19              | 26              | 32               | 37               | 41               | 43               | 45               | 45               | 45               | 44               | 43               | 39               | 35               | 28               | 21               | 15               | 10               | 8                |
| 120                       | 11             | 10              | 12              | 17              | 23              | 29               | 34               | 38               | 41               | 42               | 43               | 44               | 44               | 43               | 41               | 37               | 32               | 25               | 19               | 14               | 10               |
| 140                       | 15             | 13              | 14              | 17              | 21              | 25               | 30               | 34               | 37               | 39               | 40               | 41               | 42               | 42               | 41               | 39               | 35               | 30               | 24               | 19               | 15               |
| 160                       | 22             | 18              | 17              | 18              | 20              | 23               | 26               | 29               | 32               | 34               | 36               | 37               | 39               | 40               | 40               | 40               | 38               | 35               | 30               | 26               | 21               |
| 180                       | 29             | 25              | 22              | 20              | 20              | 21               | 23               | 25               | 27               | 29               | 31               | 33               | 34               | 36               | 38               | 40               | 40               | 39               | 36               | 33               | 29               |
| 200                       | 36             | 32              | 28              | 24              | 21              | 20               | 20               | 21               | 22               | 24               | 26               | 27               | 29               | 32               | 35               | 38               | 41               | 42               | 42               | 40               | 36               |
| 220                       | 43             | 39              | 34              | 28              | 24              | 21               | 19               | 18               | 19               | 20               | 21               | 23               | 25               | 27               | 31               | 36               | 40               | 44               | 46               | 45               | 43               |
| 240                       | 48             | 45              | 39              | 33              | 27              | 22               | 19               | 17               | 16               | 17               | 17               | 18               | 20               | 23               | 27               | 33               | 38               | 44               | 48               | 49               | 48               |
| 260                       | 52             | 49              | 44              | 37              | 30              | 24               | 20               | 17               | 15               | 15               | 15               | 16               | 17               | 20               | 24               | 29               | 36               | 42               | 48               | 51               | 51               |
| 280                       | 52             | 51              | 47              | 41              | 34              | 27               | 22               | 19               | 16               | 15               | 15               | 15               | 16               | 18               | 21               | 26               | 32               | 39               | 46               | 50               | 52               |
| 300                       | 50             | 50              | 48              | 43              | 37              | 31               | 26               | 22               | 19               | 17               | 16               | 16               | 16               | 17               | 19               | 23               | 29               | 35               | 42               | 47               | 50               |
| 320                       | 46             | 47              | 47              | 44              | 39              | 34               | 29               | 26               | 23               | 21               | 19               | 18               | 18               | 18               | 19               | 21               | 25               | 31               | 36               | 42               | 46               |
| 340                       | 39             | 42              | 44              | 43              | 40              | 37               | 33               | 30               | 27               | 25               | 24               | 22               | 21               | 20               | 19               | 20               | 22               | 26               | 30               | 35               | 39               |
| 360                       | 32             | 36              | 39              | 40              | 40              | 39               | 37               | 35               | 32               | 30               | 29               | 27               | 25               | 23               | 22               | 21               | 20               | 22               | 24               | 28               | 32               |
| 380                       | 24             | 29              | 33              | 37              | 39              | 39               | 40               | 38               | 37               | 35               | 34               | 32               | 30               | 27               | 25               | 22               | 19               | 18               | 19               | 21               | 25               |
| 400                       | 18             | 22              | 27              | 32              | 37              | 40               | 41               | 41               | 41               | 40               | 39               | 37               | 35               | 32               | 28               | 24               | 20               | 17               | 15               | 15               | 18               |

The unit in this Table equals 0<sup>d</sup>.0001.

Applied Constant: +30.

The entries are positive.

The Equation of this Table to be added to that of Table IV.

VII

Equations of Conjunction

VIII

E., O., S., T.

| 1               | 2                   |
|-----------------|---------------------|
| $\delta$        | Equation            |
| d               | d                   |
| 0 <sup>00</sup> | 0 <sup>00</sup> 030 |
| 0 <sup>10</sup> | 0 <sup>00</sup> 022 |
| 0 <sup>20</sup> | 15                  |
| 0 <sup>30</sup> | 10                  |
| 0 <sup>40</sup> | 7                   |
| 0 <sup>50</sup> | 8                   |
| 0 <sup>60</sup> | 0 <sup>00</sup> 011 |
| 0 <sup>70</sup> | 16                  |
| 0 <sup>80</sup> | 23                  |
| 0 <sup>90</sup> | 31                  |
| 1 <sup>00</sup> | 39                  |
| 1 <sup>10</sup> | 0 <sup>00</sup> 046 |
| 1 <sup>20</sup> | 51                  |
| 1 <sup>30</sup> | 53                  |
| 1 <sup>40</sup> | 52                  |
| 1 <sup>50</sup> | 48                  |
| 1 <sup>60</sup> | 0 <sup>00</sup> 043 |
| 1 <sup>70</sup> | 35                  |
| 1 <sup>80</sup> | 27                  |
| 1 <sup>90</sup> | 20                  |
| 2 <sup>00</sup> | 0 <sup>00</sup> 013 |

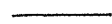
| 1               | 2                   | 1               | 2                   |
|-----------------|---------------------|-----------------|---------------------|
| $\epsilon$      | Equation            | $\epsilon$      | Equation            |
| d               | d                   | d               | d                   |
| 0 <sup>00</sup> | 0 <sup>00</sup> 003 | 1 <sup>00</sup> | 0 <sup>00</sup> 004 |
| 0 <sup>05</sup> | 0 <sup>00</sup> 004 | 1 <sup>05</sup> | 0 <sup>00</sup> 005 |
| 0 <sup>10</sup> | 5                   | 1 <sup>10</sup> | 5                   |
| 0 <sup>15</sup> | 5                   | 1 <sup>15</sup> | 5                   |
| 0 <sup>20</sup> | 5                   | 1 <sup>20</sup> | 5                   |
| 0 <sup>25</sup> | 5                   | 1 <sup>25</sup> | 4                   |
| 0 <sup>30</sup> | 0 <sup>00</sup> 005 | 1 <sup>30</sup> | 0 <sup>00</sup> 004 |
| 0 <sup>35</sup> | 4                   | 1 <sup>35</sup> | 3                   |
| 0 <sup>40</sup> | 4                   | 1 <sup>40</sup> | 2                   |
| 0 <sup>45</sup> | 3                   | 1 <sup>45</sup> | 2                   |
| 0 <sup>50</sup> | 2                   | 1 <sup>50</sup> | 1                   |
| 0 <sup>55</sup> | 0 <sup>00</sup> 002 | 1 <sup>55</sup> | 0 <sup>00</sup> 001 |
| 0 <sup>60</sup> | 1                   | 1 <sup>60</sup> | 1                   |
| 0 <sup>65</sup> | 1                   | 1 <sup>65</sup> | 1                   |
| 0 <sup>70</sup> | 1                   | 1 <sup>70</sup> | 2                   |
| 0 <sup>75</sup> | 1                   | 1 <sup>75</sup> | 3                   |
| 0 <sup>80</sup> | 0 <sup>00</sup> 002 | 1 <sup>80</sup> | 0 <sup>00</sup> 003 |
| 0 <sup>85</sup> | 2                   | 1 <sup>85</sup> | 4                   |
| 0 <sup>90</sup> | 3                   | 1 <sup>90</sup> | 5                   |
| 0 <sup>95</sup> | 4                   | 1 <sup>95</sup> | 5                   |
| 1 <sup>00</sup> | 0 <sup>00</sup> 004 | 2 <sup>00</sup> | 0 <sup>00</sup> 005 |

Applied Constant: +0<sup>d</sup>.0030.

Applied Constant: +0<sup>d</sup>.0003.

The Equations of Tables VII, VIII to be applied to the entries of Table I, Column 2.

# SATELLITE I



## Tables

of the

Longitude on Jupiter's Orbit,  
Variation of the Radius Vector,  
and the Latitude

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

IX Values at Epoch of Mean Longitude and the Arguments

| 1       | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           |
|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Date    | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            |
|         | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| 1850.0  | 306.02002    | 0.32284      | 2.085        | 0.222        | 0.457        | 0.285        | 223.78       | 451.85       | 205.04       |
| 1851.0  | 59.50226     | 2.20010      | 0.437        | 0.496        | 1.002        | 0.840        | 187.62       | 359.18       | 87.74        |
| *1852.0 | 172.98450    | 0.55188      | 1.139        | 0.771        | 1.547        | 1.394        | 151.46       | 266.50       | 452.74       |
| 1853.0  | 129.95573    | 3.42914      | 0.491        | 0.275        | 1.323        | 1.179        | 116.31       | 174.83       | 336.44       |
| 1854.0  | 243.43797    | 1.78093      | 1.193        | 0.550        | 0.099        | 1.733        | 80.15        | 82.15        | 219.14       |
| 1855.0  | 356.92021    | 0.13272      | 1.895        | 0.824        | 0.645        | 0.518        | 43.99        | 447.15       | 101.83       |
| *1856.0 | 110.40245    | 2.00997      | 0.247        | 1.099        | 1.190        | 1.073        | 7.84         | 354.48       | 466.83       |
| 1857.0  | 67.37368     | 1.36176      | 1.949        | 0.603        | 0.966        | 0.858        | 373.84       | 262.80       | 350.53       |
| 1858.0  | 180.85592    | 3.23901      | 0.301        | 0.878        | 1.511        | 1.412        | 337.68       | 170.13       | 233.23       |
| 1859.0  | 294.33815    | 1.59080      | 1.003        | 1.152        | 0.287        | 0.197        | 301.52       | 77.45        | 115.93       |
| *1860.0 | 47.82039     | 3.46805      | 1.705        | 1.427        | 0.832        | 0.752        | 265.37       | 442.45       | 480.93       |
| 1861.0  | 4.79162      | 2.81984      | 1.057        | 0.931        | 0.608        | 0.537        | 230.21       | 350.78       | 364.63       |
| 1862.0  | 118.27386    | 1.17163      | 1.759        | 1.205        | 1.154        | 1.091        | 194.05       | 258.10       | 247.33       |
| 1863.0  | 231.75610    | 3.04889      | 0.111        | 1.480        | 1.699        | 1.645        | 157.89       | 165.43       | 130.02       |
| *1864.0 | 345.23834    | 1.40067      | 0.813        | 1.755        | 0.475        | 0.430        | 121.74       | 72.75        | 12.72        |
| 1865.0  | 302.20957    | 0.75246      | 0.165        | 1.259        | 0.251        | 0.215        | 86.58        | 438.75       | 378.72       |
| 1866.0  | 55.69181     | 2.62972      | 0.867        | 1.533        | 0.796        | 0.770        | 50.42        | 346.08       | 261.42       |
| 1867.0  | 169.17405    | 0.98151      | 1.569        | 0.037        | 1.341        | 1.324        | 14.27        | 253.40       | 144.12       |
| *1868.0 | 282.65629    | 2.85876      | 2.271        | 0.312        | 0.117        | 0.109        | 379.27       | 160.73       | 26.82        |
| 1869.0  | 239.62752    | 2.21055      | 1.623        | 1.587        | 1.663        | 1.663        | 344.11       | 69.06        | 392.82       |
| 1870.0  | 353.10976    | 0.56234      | 2.325        | 0.091        | 0.439        | 0.449        | 307.95       | 434.06       | 275.51       |
| 1871.0  | 106.59200    | 2.43959      | 0.677        | 0.365        | 0.984        | 1.003        | 271.80       | 341.38       | 158.21       |
| *1872.0 | 220.07424    | 0.79138      | 1.379        | 0.640        | 1.529        | 1.557        | 235.64       | 248.71       | 40.91        |
| 1873.0  | 177.04547    | 0.14317      | 0.730        | 0.144        | 1.305        | 1.342        | 200.48       | 157.03       | 406.91       |
| 1874.0  | 290.52771    | 2.02042      | 1.433        | 0.419        | 0.081        | 0.127        | 164.33       | 64.36        | 289.61       |
| 1875.0  | 44.00994     | 0.37221      | 2.135        | 0.693        | 0.626        | 0.682        | 128.17       | 429.36       | 172.31       |
| *1876.0 | 157.49218    | 2.24946      | 0.486        | 0.968        | 1.172        | 1.236        | 92.01        | 336.68       | 55.00        |
| 1877.0  | 114.46341    | 1.60125      | 2.188        | 0.472        | 0.948        | 1.021        | 56.85        | 245.01       | 421.00       |
| 1878.0  | 227.94565    | 3.47851      | 0.540        | 0.747        | 1.493        | 1.575        | 20.70        | 152.33       | 303.70       |
| 1879.0  | 341.42789    | 1.83029      | 1.242        | 1.021        | 0.269        | 0.360        | 385.70       | 59.66        | 186.40       |
| *1880.0 | 94.91013     | 0.18208      | 1.944        | 1.296        | 0.814        | 0.915        | 349.54       | 424.66       | 69.10        |
| 1881.0  | 51.88136     | 3.05934      | 1.296        | 0.800        | 0.590        | 0.700        | 314.38       | 332.98       | 435.10       |
| 1882.0  | 165.36360    | 1.41113      | 1.998        | 1.075        | 1.135        | 1.254        | 278.23       | 240.31       | 317.80       |
| 1883.0  | 278.84584    | 3.28838      | 0.350        | 1.349        | 1.681        | 0.039        | 242.07       | 147.63       | 200.49       |
| *1884.0 | 32.32808     | 1.64017      | 1.052        | 1.624        | 0.457        | 0.594        | 205.91       | 54.96        | 83.19        |
| 1885.0  | 349.29931    | 0.99196      | 0.404        | 1.128        | 0.233        | 0.379        | 170.76       | 420.96       | 449.19       |
| 1886.0  | 102.78155    | 2.86921      | 1.106        | 1.403        | 0.778        | 0.933        | 134.60       | 328.28       | 331.89       |
| 1887.0  | 216.26379    | 1.22100      | 1.808        | 1.677        | 1.323        | 1.487        | 98.44        | 235.61       | 214.59       |
| *1888.0 | 329.74603    | 3.09825      | 0.160        | 0.181        | 0.099        | 0.272        | 62.29        | 142.93       | 97.29        |
| 1889.0  | 286.71726    | 2.45004      | 1.862        | 1.456        | 1.644        | 0.058        | 27.13        | 51.26        | 463.29       |
| 1890.0  | 40.19950     | 0.80183      | 0.214        | 1.730        | 0.421        | 0.612        | 392.13       | 416.26       | 345.99       |
| 1891.0  | 153.68173    | 2.67908      | 0.916        | 0.235        | 0.966        | 1.166        | 355.97       | 323.58       | 228.68       |
| *1892.0 | 267.16397    | 1.03087      | 1.618        | 0.509        | 1.511        | 1.720        | 319.82       | 230.91       | 111.38       |
| 1893.0  | 224.13520    | 0.38266      | 0.970        | 0.013        | 1.287        | 1.505        | 284.66       | 139.23       | 477.38       |
| 1894.0  | 337.61744    | 2.25992      | 1.672        | 0.288        | 0.063        | 0.291        | 248.50       | 46.56        | 360.08       |
| 1895.0  | 91.09968     | 0.61170      | 0.024        | 0.562        | 0.608        | 0.845        | 212.34       | 411.56       | 242.78       |
| *1896.0 | 204.58192    | 2.48896      | 0.726        | 0.837        | 1.153        | 1.399        | 176.19       | 318.88       | 125.48       |
| 1897.0  | 161.55315    | 1.84075      | 0.078        | 0.341        | 0.930        | 1.184        | 141.03       | 227.21       | 9.17         |
| 1898.0  | 275.03539    | 0.19254      | 0.780        | 0.616        | 1.475        | 1.739        | 104.87       | 134.53       | 374.17       |
| 1899.0  | 28.51763     | 2.06979      | 1.482        | 0.890        | 0.251        | 0.524        | 68.72        | 41.86        | 256.87       |
| 1900.0  | 141.99987    | 0.42158      | 2.184        | 1.165        | 0.796        | 1.078        | 32.56        | 406.86       | 139.57       |
| Periods | ...          | 3.52546      | 2.350        | 1.771        | 1.769        | 1.769        | 401.16       | 457.67       | 482.30       |

Constant subtracted from Column 2 : 0°6000.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

IX Values at Epoch of Mean Longitude and the Arguments

|        |         | 3       | 4     | 5     | 6                    | 7                   | 8     | 9    |
|--------|---------|---------|-------|-------|----------------------|---------------------|-------|------|
| I      | J       | K       | L     | M     | N                    | O                   | P     | Q    |
| 253 48 | 1850 0  | 1 7 601 | 1 698 | 0 68  | <sup>d</sup><br>1 11 | <sup>d</sup><br>1 3 | 0 8 8 | 3    |
| 13 89  | 1851 0  | 0 51449 | 0 728 | 1 99  | 1 68                 | 1                   | 0 6 1 | 0 0  |
| 12 30  | 1852 0  | 1 7211  | 1 5 5 | 146   | 49                   | 0 7                 | 0 415 | 0 61 |
| 378 3  | 1853 0  | 0 86059 | 1 555 | 1 76  | 9                    | 0 5                 | 3 4   | 43   |
| 257 71 | 1854 0  | 1 418 1 | 0 584 | 0 610 | 0 86                 | 1 0                 | 0 117 | 0 13 |
| 137 1  | 1855 0  | 0 0669  | 1 382 | 1 26  | 1 43                 | 1 6                 | 795   | 0 7  |
| 16 53  | 1856 0  | 0 76431 | 0 41  | 0 073 | 0 3                  | 0 4                 | 0 588 | 0 42 |
| 38 53  | 1857 0  | 0 55 79 | 441   | 1 690 | 0 03                 | 0                   | 0 497 | 0 24 |
| 61 95  | 1858 0  | 1 11041 | 1 39  | 0 537 | 0 60                 | 7                   | 0 291 | 0 8  |
| 141 35 | 1859 0  | 1 66803 | 0 268 | 1 153 | 1 17                 | 1 3                 | 0 084 | 0 53 |
| 20 76  | *1860 0 | 45651   | 1 066 | 0 001 | 1 74                 | 0 1                 | 0 762 | 0 23 |
| 386 76 | 1861 0  | 0 4499  | 1 95  | 1 617 | 1 54                 | 1 7                 | 0 671 | 0 5  |
| 66 17  | 1862 0  | 0 80260 | 0 1 5 | 464   | 0 34                 | 0 5                 | 0 464 | 63   |
| 145 58 | 1863 0  | 1 3602  | 9 3   | 1 08  | 91                   | 1 0                 | 0 57  | 0 34 |
| 4 99   | 1864 0  | 0 1487  | 1 720 | 1 697 | 1 48                 | 1 6                 | 0 051 | 0 04 |
| 390 99 | 1865 0  | 1 7063  | 1 750 | 1 544 | 1 28                 | 1 4                 | 0 844 | 0 74 |
| 7 40   | 1866 0  | 0 49480 | 0 779 | 0 391 | 0 08                 | 0 2                 | 0 637 | 0 44 |
| 149 81 | 1867 0  | 1 05242 | 1 577 | 1 8   | 65                   | 0 7                 | 0 431 | 14   |
| 29     | *1868 0 | 1 61004 | 6 7   | 1 6 4 | 1 2                  | 1 3                 | 0 24  | 73   |
| 395    | 1869 0  | 1 3985  | 0 636 | 1 471 | 1                    | 1 1                 | 0 133 | 0 55 |
| 74 63  | 1870 0  | 187     | 1 434 | 0 319 | 1 59                 | 1 6                 | 0 811 | 0 5  |
| 154 04 | 1871 0  | 0 7446  | 0 463 | 935   | 0 40                 | 0 4                 | 0 604 | 0 84 |
| 33 45  | *1872 0 | 1 30 23 | 1 61  | 1 551 | 0 97                 | 1 0                 | 0 397 | 54   |
| 399 45 | 1873 0  | 1 9 71  | 1 90  | 1 399 | 0 77                 | 0 8                 | 0 307 | 0 36 |
| 278 86 | 1874 0  | 1 64833 | 0 3 0 | 0 46  | 1 34                 | 1 3                 | 0 100 | 0 06 |
| 158 27 | 1875 0  | 0 43681 | 1 118 | 86    | 0 14                 | 0 1                 | 0 778 | 0 65 |
| 37 68  | 1876 0  | 0 99443 | 147   | 1 478 | 0 71                 | 7                   | 571   | 0 35 |
| 403 68 | 1877 0  | 0 78 91 | 177   | 1 326 | 0 51                 | 0 5                 | 480   | 0 17 |
| 83 09  | 1878 0  | 1 34053 | 974   | 0 173 | 1 08                 | 1                   | 0 73  | 0 75 |
| 16 51  | 1879 0  | 0 1 9 1 | 0 004 | 0 789 | 1 65                 | 1 6                 | 0 067 | 0 46 |
| 41 92  | *1880 0 | 0 68663 | 0 8 1 | 1 406 | 0 45                 | 0 4                 | 0 744 | 16   |
| 407 9  | 1881 0  | 0 47511 | 831   | 1 53  | 0 5                  | 0                   | 0 653 | 86   |
| 287 33 | 1882 0  | 1 03 73 | 1 629 | 1 0   | 82                   | 0 8                 | 447   | 0 56 |
| 166 74 | 1883 0  | 1 59 34 | 0 658 | 717   | 1 39                 | 1 3                 | 0 40  | 0 27 |
| 46 15  | *1884 0 | 0 37883 | 1 456 | 1 333 | 0 19                 | 0 1                 | 0 033 | 0 85 |
| 41 15  | 1885 0  | 0 16731 | 1 485 | 1 180 | 1 76                 | 1 7                 | 0 8 7 | 0 67 |
| 291 56 | 1886 0  | 7 49    | 0 515 | 0 028 | 0 56                 | 0 5                 | 6 0   | 0 37 |
| 170 97 | 1887 0  | 1 28 54 | 1 31  | 644   | 1 13                 | 1 0                 | 0 413 | 0 8  |
| 5 38   | *1888 0 | 0 7102  | 34    | 1 6   | 1 7                  | 1 6                 | 7     | 0 66 |
| 4 6 38 | 1889 0  | 6 864   | 0 37  | 1 1 8 | 1 50                 | 1 4                 | 116   | 0 48 |
| 95 19  | 1890 0  | 0 4171  | 1 169 | 1 724 | 0 31                 | 0 2                 | 0 794 | 0 18 |
| 175    | 1891 0  | 97474   | 0 199 | 0 571 | 0 88                 | 0 7                 | 0 587 | 0 77 |
| 54 61  | *1892 0 | 1 53 36 | 996   | 1 187 | 1 45                 | 1 3                 | 0 380 | 0 47 |
| 4 61   | 1893 0  | 1 3 084 | 1 0 6 | 1 035 | 1 5                  | 1 1                 | 0 89  | 0 29 |
| 3 0    | 1894 0  | 1 932   | 0 056 | 1 651 | 0 5                  | 1 6                 | 0 083 | 0 0  |
| 79 43  | 1895 0  | 66694   | 0 853 | 0 499 | 0 6                  | 0 4                 | 0 76  | 0 58 |
| 58 84  | 1896 0  | 1 455   | 1 651 | 1 115 | 1 19                 | 1 0                 | 0 554 | 0 8  |
| 424 84 | 1897 0  | 1 013 3 | 1 68  | 0 96  | 0 99                 | 0 8                 | 0 463 | 0 10 |
| 304 5  | 1898 0  | 1 57065 | 0 710 | 1 578 | 1 56                 | 1 3                 | 0 256 | 0 69 |
| 183 66 | 1899 0  | 0 35913 | 1 507 | 0 426 | 0 36                 | 0 1                 | 0 049 | 0 39 |
| 63 7   | 1900 0  | 0 91675 | 0 537 | 1 04  | 93                   | 0 7                 | 0 727 | 0 09 |
| 485 59 | P 10ds  | 1 76914 | 1 768 | 1 769 | 1 77                 | 1 8                 | 0 884 | 0 88 |

T f d t h T L g i t d l d t J p t O b t t l t f C l m m t h p p l m t e l l y t h t i f T b l X I I V X I V



# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

| 1       | 2          | 3       | 4     | 5     | 6     | 7     | 8      | 9      | 10     |
|---------|------------|---------|-------|-------|-------|-------|--------|--------|--------|
| Date    | Mean Long. | A       | B     | C     | D     | E     | F      | G      | H      |
|         | °          | d       | d     | d     | d     | d     | d      | d      | d      |
| 1900·0  | 141·99987  | 0·42158 | 2·184 | 1·165 | 0·796 | 1·078 | 32·56  | 406·86 | 139·57 |
| 1901·0  | 255·48211  | 2·29883 | 0·536 | 1·440 | 1·341 | 1·632 | 397·56 | 314·19 | 22·27  |
| 1902·0  | 8·96435    | 0·65062 | 1·238 | 1·714 | 0·117 | 0·417 | 361·40 | 221·51 | 387·27 |
| 1903·0  | 122·44659  | 2·52787 | 1·940 | 0·218 | 0·662 | 0·972 | 325·25 | 128·84 | 269·97 |
| *1904·0 | 235·92882  | 0·87966 | 0·292 | 0·493 | 1·208 | 1·526 | 289·09 | 36·16  | 152·66 |
| 1905·0  | 192·90006  | 0·23145 | 1·994 | 1·768 | 0·984 | 1·311 | 253·93 | 402·16 | 36·36  |
| 1906·0  | 306·38229  | 2·10870 | 0·346 | 0·272 | 1·529 | 0·096 | 217·78 | 309·49 | 401·36 |
| 1907·0  | 59·86453   | 0·46049 | 1·048 | 0·546 | 0·305 | 0·651 | 181·62 | 216·81 | 284·06 |
| *1908·0 | 173·34677  | 2·33775 | 1·750 | 0·821 | 0·850 | 1·205 | 145·46 | 124·14 | 166·76 |
| 1909·0  | 130·31800  | 1·68954 | 1·102 | 0·325 | 0·626 | 0·990 | 110·31 | 32·46  | 50·46  |
| 1910·0  | 243·80024  | 0·04132 | 1·804 | 0·600 | 1·172 | 1·544 | 74·15  | 397·46 | 415·46 |
| 1911·0  | 357·28248  | 1·91858 | 0·156 | 0·874 | 1·717 | 0·329 | 37·99  | 304·79 | 298·15 |
| *1912·0 | 110·76472  | 0·27037 | 0·858 | 1·149 | 0·493 | 0·884 | 1·84   | 212·11 | 180·85 |
| 1913·0  | 67·73595   | 3·14762 | 0·209 | 0·653 | 0·269 | 0·669 | 367·84 | 120·44 | 64·55  |
| 1914·0  | 181·21819  | 1·49941 | 0·912 | 0·928 | 0·814 | 1·223 | 331·68 | 27·76  | 429·55 |
| 1915·0  | 294·70043  | 3·37666 | 1·614 | 1·202 | 1·359 | 0·008 | 295·52 | 392·76 | 312·25 |
| *1916·0 | 48·18267   | 1·72845 | 2·316 | 1·477 | 0·135 | 0·562 | 259·37 | 300·09 | 194·95 |
| 1917·0  | 5·15390    | 1·08024 | 1·668 | 0·981 | 1·681 | 0·348 | 224·21 | 208·41 | 78·65  |
| 1918·0  | 118·63614  | 2·95749 | 0·019 | 1·255 | 0·457 | 0·902 | 188·05 | 115·74 | 443·65 |
| 1919·0  | 232·11838  | 1·30928 | 0·721 | 1·530 | 1·002 | 1·456 | 151·90 | 23·06  | 326·34 |
| *1920·0 | 345·60061  | 3·18654 | 1·424 | 0·034 | 1·547 | 0·241 | 115·74 | 388·06 | 209·04 |
| 1921·0  | 302·57185  | 2·53832 | 0·775 | 1·309 | 1·323 | 0·026 | 80·58  | 296·39 | 92·74  |
| 1922·0  | 56·05408   | 0·89011 | 1·477 | 1·583 | 0·099 | 0·581 | 44·42  | 203·71 | 457·74 |
| 1923·0  | 169·53632  | 2·76737 | 2·180 | 0·087 | 0·644 | 1·135 | 8·27   | 111·04 | 340·44 |
| *1924·0 | 283·01856  | 1·11916 | 0·531 | 0·362 | 1·190 | 1·689 | 373·27 | 18·36  | 223·14 |
| 1925·0  | 239·98979  | 0·47095 | 2·233 | 1·637 | 0·966 | 1·474 | 338·11 | 384·36 | 106·83 |
| 1926·0  | 353·47203  | 2·34820 | 0·585 | 0·141 | 1·511 | 0·259 | 301·95 | 291·69 | 471·83 |
| 1927·0  | 106·95427  | 0·69999 | 1·287 | 0·415 | 0·287 | 0·814 | 265·79 | 199·01 | 354·53 |
| *1928·0 | 220·43651  | 2·57724 | 1·989 | 0·690 | 0·832 | 1·368 | 229·64 | 106·34 | 237·23 |
| 1929·0  | 177·40774  | 1·92903 | 1·341 | 0·194 | 0·608 | 1·153 | 194·48 | 14·66  | 120·93 |
| 1930·0  | 290·88998  | 0·28082 | 2·043 | 0·469 | 1·153 | 1·707 | 158·32 | 379·66 | 3·63   |
| 1931·0  | 44·37222   | 2·15807 | 0·395 | 0·743 | 1·699 | 0·493 | 122·17 | 286·99 | 368·63 |
| *1932·0 | 157·85446  | 0·50986 | 1·097 | 1·018 | 0·475 | 1·047 | 86·01  | 194·32 | 251·32 |
| 1933·0  | 114·82569  | 3·38711 | 0·449 | 0·522 | 0·251 | 0·832 | 50·85  | 102·64 | 135·02 |
| 1934·0  | 228·30793  | 1·73890 | 1·151 | 0·797 | 0·796 | 1·386 | 14·70  | 9·97   | 17·72  |
| 1935·0  | 341·79017  | 0·09069 | 1·853 | 1·071 | 1·341 | 0·171 | 379·70 | 374·97 | 382·72 |
| *1936·0 | 95·27240   | 1·96795 | 0·205 | 1·346 | 0·117 | 0·726 | 343·54 | 282·29 | 265·42 |
| 1937·0  | 52·24364   | 1·31973 | 1·907 | 0·850 | 1·662 | 0·511 | 308·38 | 190·62 | 149·12 |
| 1938·0  | 165·72587  | 3·19699 | 0·259 | 1·125 | 0·438 | 1·065 | 272·23 | 97·94  | 31·81  |
| 1939·0  | 279·20811  | 1·54878 | 0·961 | 1·399 | 0·984 | 1·619 | 236·07 | 5·27   | 396·81 |
| *1940·0 | 32·69035   | 3·42603 | 1·663 | 1·674 | 1·529 | 0·405 | 199·91 | 370·27 | 279·51 |
| 1941·0  | 349·66158  | 2·77782 | 1·015 | 1·178 | 1·305 | 0·190 | 164·75 | 278·59 | 163·21 |
| 1942·0  | 103·14382  | 1·12961 | 1·717 | 1·453 | 0·081 | 0·744 | 128·60 | 185·92 | 45·91  |
| 1943·0  | 216·62606  | 3·00686 | 0·069 | 1·727 | 0·626 | 1·298 | 92·44  | 93·24  | 410·91 |
| *1944·0 | 330·10830  | 1·35865 | 0·771 | 0·231 | 1·171 | 0·083 | 56·28  | 0·57   | 293·61 |
| 1945·0  | 287·07953  | 0·71044 | 0·123 | 1·506 | 0·947 | 1·638 | 21·13  | 366·57 | 177·31 |
| 1946·0  | 40·56177   | 2·58769 | 0·825 | 0·010 | 1·493 | 0·423 | 386·13 | 273·89 | 60·00  |
| 1947·0  | 154·04401  | 0·93948 | 1·527 | 0·285 | 0·269 | 0·977 | 349·97 | 181·22 | 425·00 |
| *1948·0 | 267·52625  | 2·81673 | 2·229 | 0·559 | 0·814 | 1·531 | 313·81 | 88·54  | 307·70 |
| 1949·0  | 224·49748  | 2·16852 | 1·581 | 0·063 | 0·590 | 1·316 | 278·66 | 454·54 | 191·40 |
| 1950·0  | 337·97972  | 0·52031 | 2·283 | 0·338 | 1·135 | 0·102 | 242·50 | 361·87 | 74·10  |
| Periods | ...        | 3·52546 | 2·350 | 1·771 | 1·769 | 1·769 | 401·16 | 457·67 | 482·30 |

Constant subtracted from Column 2: 0°·60000.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

|        |          | 3       | 4     | 5                    | 6    | 7   | 8                   | 9                   |
|--------|----------|---------|-------|----------------------|------|-----|---------------------|---------------------|
| I      | J        | K       | L     | M                    | N    | O   | P                   | Q                   |
| 63 7   | 1900 0   | 091675  | 537   | <sup>d</sup><br>1 04 | 093  | 07  | <sup>1</sup><br>7 7 | <sup>1</sup><br>009 |
| 428 07 | 1901 0   | 1 47437 | 1 335 | 1 658                | 1 50 | 1 3 | 5                   | 0 68                |
| 3 7 48 | 1902 0   | 6 85    | 364   | 0 5 6                | 0 30 | 1   | 0 314               | 0 38                |
| 186 89 | 1903 0   | 0 8 047 | 1 162 | 1 1                  | 0 87 | 0 6 | 107                 | 0 08                |
| 66 3   | *1904 0  | 1 378 8 | 191   | 1 738                | 1 44 | 1   | 0 785               | 0 67                |
| 43 3   | 1905 0   | 1 16656 | 0 21  | 1 586                | 1 4  | 1 0 | 0 694               | 0 49                |
| 311 71 | 1906 0   | 1 7 418 | 1 18  | 0 433                | 0 04 | 1 5 | 0 487               | 19                  |
| 191 1  | 1907 0   | 0 51 66 | 0 48  | 1 049                | 0 61 | 0 3 | 0 80                | 78                  |
| 7 53   | 1908 0   | 1 70 8  | 0 846 | 1 665                | 18   | 0 9 | 0 74                | 0 48                |
| 436 53 | 1909 0   | 85876   | 0 875 | 1 513                | 0 98 | 0 7 | 867                 | 0 30                |
| 315 94 | 1910 0   | 1 11638 | 1 673 | 0 360                | 1 55 | 1   | 0 661               | 0 0                 |
| 19 35  | 1911 0   | 486     | 0 702 | 0 976                | 0 36 | 0 0 | 454                 | 0 58                |
| 74 76  | 1912 0   | 76248   | 1 50  | 1 593                | 93   | 0 6 | 0 47                | 0 29                |
| 44 76  | 1913 0   | 0 55 96 | 1 5 9 | 1 440                | 0 73 | 4   | 0 156               | 0 10                |
| 3 0 17 | 1914 0   | 1 10858 | 559   | 0 87                 | 1 30 | 0 9 | 0 834               | 0 69                |
| 199 58 | 1915 0   | 1 66619 | 1 357 | 0 9 4                | 0 10 | 1 5 | 6 7                 | 0 39                |
| 78 99  | *1916 0  | 45468   | 0 386 | 1 5 0                | 67   | 0 3 | 0 4 1               | 0 10                |
| 444 99 | 1917 0   | 0 4316  | 416   | 1 367                | 0 47 | 0 1 | 0 330               | 0 80                |
| 324 40 | 1918 0   | 0 80 77 | 1 13  | 0 15                 | 1 04 | 0 6 | 0 1 3               | 5                   |
| 2 3 81 | 1919 0   | 1 35839 | 0 243 | 0 831                | 1 61 | 1   | 801                 | 0 0                 |
| 83     | 1920 0   | 0 14687 | 1 041 | 1 447                | 0 41 | 0 0 | 0 594               | 0 79                |
| 449 2  | 1921 0   | 1 70449 | 1 070 | 1 95                 | 0 1  | 1 6 | 0 503               | 0 61                |
| 3 8 63 | 1922 0   | 0 49 97 | 0 100 | 0 14                 | 0 78 | 0 4 | 0 296               | 0 31                |
| 2 8 5  | 1923 0   | 1 5059  | 897   | 758                  | 1 35 | 0 9 | 0 90                | 0 01                |
| 87 46  | 1924 0   | 1 608 1 | 1 695 | 1 374                | 0 15 | 1 5 | 767                 | 60                  |
| 453 46 | 1925 0   | 1 39669 | 1 724 | 1 2                  | 1 7  | 1 3 | 0 677               | 0 4                 |
| 332 87 | 1926 0   | 18517   | 754   | 0 69                 | 0 52 | 1   | 0 470               | 0 12                |
| 212 28 | 1927 0   | 0 74 79 | 1 52  | 685                  | 1 09 | 6   | 0 63                | 0 71                |
| 91 69  | *1928 0  | 1 30040 | 0 581 | 1 30                 | 1 66 | 1 2 | 0 057               | 0 41                |
| 457 69 | 1929 0   | 1 08888 | 0 611 | 1 149                | 1 46 | 1 0 | 0 850               | 0 23                |
| 337    | 1930 0   | 1 6465  | 1 408 | 1 765                | 7    | 1 5 | 0 643               | 0 81                |
| 16 51  | 1931 0   | 0 43498 | 438   | 0 613                | 0 84 | 3   | 0 437               | 0 5                 |
| 95 9   | 1932 0   | 0 99 60 | 1 35  | 1 29                 | 1 41 | 0 9 | 230                 | 0 22                |
| 461 9  | 1933 0   | 0 78108 | 1 65  | 1 076                | 1 1  | 0 7 | 139                 | 0 04                |
| 341 33 | 1934 0   | 1 33870 | 0 295 | 1 693                | 0 1  | 1 2 | 817                 | 0 62                |
| 0 74   | 1935 0   | 0 1 718 | 1 09  | 0 540                | 0 58 | 0   | 0 610               | 0 3                 |
| 100 15 | *1936 0  | 0 6848  | 0 1   | 1 156                | 1 15 | 0 6 | 403                 | 0 03                |
| 466 15 | 1937 0   | 0 473 8 | 0 151 | 1 004                | 0 95 | 0 4 | 0 312               | 0 73                |
| 345 56 | 1938 0   | 1 3090  | 949   | 1 6 0                | 1 51 | 9   | 0 106               | 0 43                |
| 2 4 97 | 1939 0   | 1 58851 | 1 747 | 467                  | 0 32 | 1 5 | 0 783               | 13                  |
| 104 38 | 1940 0   | 37699   | 0 776 | 1 083                | 89   | 0 3 | 0 577               | 0 7                 |
| 47 38  | 1941 0   | 0 16547 | 806   | 0 931                | 0 69 | 0 1 | 0 486               | 0 54                |
| 349 79 | 1942 0   | 723 9   | 1 603 | 1 547                | 1 6  | 0 7 | 0 79                | 0 4                 |
| 9 2    | 1943 0   | 1 8071  | 0 633 | 394                  | 0 6  | 1 2 | 0 73                | 0 83                |
| 108 61 | 1944 0   | 0 6919  | 1 430 | 1 011                | 0 63 | 0   | 750                 | 0 53                |
| 474 61 | 1945 0   | 1 6 681 | 1 460 | 0 858                | 0 43 | 1 6 | 0 659               | 0 35                |
| 354 01 | 1946 0   | 0 41529 | 0 490 | 1 474                | 1 0  | 0 4 | 0 453               | 0 05                |
| 233 43 | 1947 0   | 0 97 91 | 1 287 | 0 3 2                | 1 57 | 0 9 | 0 246               | 0 64                |
| 11 84  | 1948 0   | 1 53 53 | 0 317 | 938                  | 0 37 | 1 5 | 0 39                | 0 34                |
| 478 84 | 1949 0   | 1 319 1 | 0 346 | 0 785                | 18   | 1 3 | 0 833               | 0 16                |
| 358 25 | 1950 0   | 10749   | 1 144 | 1 402                | 0 75 | 0 1 | 626                 | 0 74                |
| 485 59 | P r i ds | 1 76914 | 1 768 | 1 769                | 1 77 | 1 8 | 0 884               | 0 88                |

T find th T L git l d d to J pit O bt th ti f C l m m th ppl m t d by th quati f T bl XII XXIV

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

IX *continued*      Values at Epoch of Mean Longitude and the Arguments

| 1       | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           |
|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Date    | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            |
|         | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| 1950·0  | 337°97972    | 0°52031      | 2°283        | 0°338        | 1°135        | 0°102        | 242°50       | 361°87       | 74°10        |
| 1951·0  | 91°46196     | 2°39757      | 0°635        | 0°612        | 1°680        | 0°656        | 206°34       | 269°19       | 439°10       |
| *1952·0 | 204°94420    | 0°74935      | 1°337        | 0°887        | 0°456        | 1°210        | 170°19       | 176°52       | 321°80       |
| 1953·0  | 161°91543    | 0°10114      | 0°688        | 0°391        | 0°232        | 0°995        | 135°03       | 84°84        | 205°49       |
| 1954·0  | 275°39767    | 1°97840      | 1°391        | 0°666        | 0°778        | 1°550        | 98°87        | 449°84       | 88°19        |
| 1955·0  | 28°87990     | 0°33019      | 2°093        | 0°940        | 1°323        | 0°335        | 62°72        | 357°17       | 453°19       |
| *1956·0 | 142°36214    | 2°20744      | 0°444        | 1°215        | 0°099        | 0°889        | 26°56        | 264°49       | 335°89       |
| 1957·0  | 99°33337     | 1°55923      | 2°147        | 0°719        | 1°644        | 0°674        | 392°56       | 172°82       | 219°59       |
| 1958·0  | 212°81561    | 3°43648      | 0°498        | 0°994        | 0°420        | 1°228        | 356°40       | 80°14        | 102°29       |
| 1959·0  | 326°29785    | 1°78827      | 1°200        | 1°268        | 0°965        | 0°013        | 320°24       | 445°14       | 467°29       |
| *1960·0 | 79°78009     | 0°14006      | 1°903        | 1°543        | 1°511        | 0°568        | 284°09       | 352°47       | 349°98       |
| 1961·0  | 36°75132     | 3°01731      | 1°254        | 1°047        | 1°287        | 0°353        | 248°93       | 260°79       | 233°68       |
| 1962·0  | 150°23356    | 1°36910      | 1°956        | 1°322        | 0°063        | 0°907        | 212°77       | 168°12       | 116°38       |
| 1963·0  | 263°71580    | 3°24635      | 0°308        | 1°596        | 0°608        | 1°461        | 176°62       | 75°45        | 481°38       |
| *1964·0 | 17°19804     | 1°59814      | 1°010        | 0°100        | 1°153        | 0°247        | 140°46       | 440°45       | 364°08       |
| 1965·0  | 334°16927    | 0°94993      | 0°362        | 1°375        | 0°929        | 0°032        | 105°30       | 348°77       | 247°78       |
| 1966·0  | 87°65151     | 2°82719      | 1°064        | 1°650        | 1°474        | 0°586        | 69°15        | 256°10       | 130°48       |
| 1967·0  | 201°13375    | 1°17898      | 1°766        | 0°154        | 0°250        | 1°140        | 32°99        | 163°42       | 13°17        |
| *1968·0 | 314°61599    | 3°05623      | 0°118        | 0°428        | 0°796        | 1°695        | 397°99       | 70°75        | 378°17       |
| 1969·0  | 271°58722    | 2°40802      | 1°820        | 1°703        | 0°572        | 1°480        | 362°83       | 436°75       | 261°87       |
| 1970·0  | 25°06946     | 0°75981      | 0°172        | 0°207        | 1°117        | 0°265        | 326°68       | 344°07       | 144°57       |
| 1971·0  | 138°55169    | 2°63706      | 0°874        | 0°482        | 1°662        | 0°819        | 290°52       | 251°40       | 27°27        |
| *1972·0 | 252°03393    | 0°98885      | 1°576        | 0°756        | 0°438        | 1°373        | 254°36       | 158°72       | 392°27       |
| 1973·0  | 209°00516    | 0°34064      | 0°928        | 0°260        | 0°214        | 1°158        | 219°20       | 67°05        | 275°97       |
| 1974·0  | 322°48740    | 2°21789      | 1°630        | 0°535        | 0°759        | 1°713        | 183°05       | 432°05       | 158°66       |
| 1975·0  | 75°96964     | 0°56968      | 2°332        | 0°810        | 1°305        | 0°498        | 146°89       | 339°37       | 41°36        |
| *1976·0 | 189°45188    | 2°44693      | 0°684        | 1°084        | 0°081        | 1°052        | 110°73       | 246°70       | 406°36       |
| 1977·0  | 146°42311    | 1°79872      | 0°036        | 0°588        | 1°626        | 0°837        | 75°58        | 155°02       | 290°06       |
| 1978·0  | 259°90535    | 0°15051      | 0°738        | 0°863        | 0°402        | 1°392        | 39°42        | 62°35        | 172°76       |
| 1979·0  | 13°38759     | 2°02776      | 1°440        | 1°137        | 0°947        | 0°177        | 3°26         | 427°35       | 55°46        |
| *1980·0 | 126°86983    | 0°37955      | 2°142        | 1°412        | 1°492        | 0°731        | 368°26       | 334°67       | 420°46       |
| 1981·0  | 83°84106     | 3°25681      | 1°494        | 0°916        | 1°268        | 0°516        | 333°11       | 243°00       | 304°15       |
| 1982·0  | 197°32330    | 1°60860      | 2°196        | 1°191        | 0°044        | 1°070        | 296°95       | 150°32       | 186°85       |
| 1983·0  | 310°80554    | 3°48585      | 0°548        | 1°465        | 0°590        | 1°625        | 260°79       | 57°65        | 69°55        |
| *1984·0 | 64°28778     | 1°83764      | 1°250        | 1°740        | 1°135        | 0°410        | 224°64       | 422°65       | 434°55       |
| 1985·0  | 21°25901     | 1°18943      | 0°601        | 1°244        | 0°911        | 0°195        | 189°48       | 330°97       | 318°25       |
| 1986·0  | 134°74125    | 3°06668      | 1°304        | 1°519        | 1°456        | 0°749        | 153°32       | 238°30       | 200°95       |
| 1987·0  | 248°22348    | 1°41847      | 2°006        | 0°023        | 0°232        | 1°304        | 117°16       | 145°62       | 83°64        |
| *1988·0 | 1°70572      | 3°29572      | 0°358        | 0°297        | 0°777        | 0°089        | 81°01        | 52°95        | 448°64       |
| 1989·0  | 318°67695    | 2°64751      | 2°060        | 1°572        | 0°553        | 1°643        | 45°85        | 418°95       | 332°34       |
| 1990·0  | 72°15919     | 0°99930      | 0°412        | 0°076        | 1°099        | 0°428        | 9°69         | 326°27       | 215°04       |
| 1991·0  | 185°64143    | 2°87655      | 1°114        | 0°351        | 1°644        | 0°982        | 374°69       | 233°60       | 97°74        |
| *1992·0 | 299°12367    | 1°22834      | 1°816        | 0°625        | 0°420        | 1°537        | 338°54       | 140°92       | 462°74       |
| 1993·0  | 256°09490    | 0°58013      | 1°168        | 0°129        | 0°196        | 1°322        | 303°38       | 49°25        | 346°44       |
| 1994·0  | 9°57714      | 2°45738      | 1°870        | 0°404        | 0°741        | 0°107        | 267°22       | 414°25       | 229°14       |
| 1995·0  | 123°05938    | 0°80917      | 0°221        | 0°679        | 1°286        | 0°661        | 231°07       | 321°58       | 111°83       |
| *1996·0 | 236°54162    | 2°68643      | 0°924        | 0°953        | 0°062        | 1°215        | 194°91       | 228°90       | 476°83       |
| 1997·0  | 193°51285    | 2°03822      | 0°275        | 0°457        | 1°608        | 1°001        | 159°75       | 137°23       | 360°53       |
| 1998·0  | 306°99509    | 0°39001      | 0°977        | 0°732        | 0°384        | 1°555        | 123°60       | 44°55        | 243°23       |
| 1999·0  | 60°47733     | 2°26726      | 1°680        | 1°007        | 0°929        | 0°340        | 87°44        | 409°55       | 125°93       |
| *2000·0 | 173°95957    | 0°61905      | 0°031        | 1°281        | 1°474        | 0°894        | 51°28        | 316°88       | 8°63         |
| Periods | ...          | 3°52546      | 2°350        | 1°771        | 1°769        | 1°769        | 401°16       | 457°67       | 482°30       |

Constant subtracted from Column 2: 0°60000.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

|            |         | 3       | 4     | 5     | 6    | 7   | 8     | 9    |
|------------|---------|---------|-------|-------|------|-----|-------|------|
| I          | J       | K       | L     | M     | N    | O   | P     | Q    |
| d<br>358 5 | 1950 0  | 0 10749 | 1 144 | 1 402 | 0 75 | 0 1 | 0 626 | 0 74 |
| 37 66      | 1951 0  | 0 66510 | 173   | 249   | 1 3  | 0 6 | 0 419 | 0 45 |
| 117 7      | 1952 0  | 1 72    | 0 971 | 0 865 | 0 1  | 1 2 | 0 213 | 0 15 |
| 483 07     | 1953 0  | 1 1120  | 1 01  | 0 713 | 1 69 | 1 0 | 0 122 | 0 85 |
| 36 48      | 1954 0  | 1 56882 | 0 030 | 1 3 9 | 0 49 | 1 5 | 0 799 | 0 55 |
| 41 89      | 1955 0  | 0 35730 | 0 8 8 | 0 176 | 1 06 | 0 3 | 0 593 | 0 6  |
| 121 3      | *1956 0 | 91492   | 1 625 | 0 79  | 1 63 | 0 9 | 0 386 | 0 84 |
| 1 71       | 1957 0  | 0 70340 | 1 655 | 640   | 1 43 | 0 7 | 0 295 | 0 66 |
| 366 71     | 1958 0  | 1 261 2 | 0 685 | 1 56  | 0 23 | 1   | 0 088 | 0 36 |
| 46 12      | 1959 0  | 04950   | 1 48  | 0 104 | 0 80 | 0 0 | 0 766 | 0 06 |
| 125 53     | 1960 0  | 607     | 0 51  | 0 7 0 | 1 37 | 0 6 | 0 559 | 65   |
| 5 94       | 1961 0  | 0 3956  | 0 541 | 0 567 | 1 17 | 0 4 | 0 469 | 0 47 |
| 370 94     | 1962 0  | 0 953 1 | 1 339 | 1 183 | 1 74 | 0 9 | 0 26  | 0 17 |
| 250 35     | 1963 0  | 1 51083 | 0 368 | 0 031 | 0 54 | 1 5 | 0 055 | 0 76 |
| 1 976      | *1964 0 | 0 9931  | 1 166 | 647   | 1 11 | 0 3 | 0 733 | 0 46 |
| 1 17       | 1965 0  | 0 08779 | 1 196 | 0 494 | 0 91 | 1   | 0 642 | 0 28 |
| 375 17     | 1966 0  | 0 64541 | 0 5   | 1 111 | 1 48 | 0 7 | 0 435 | 0 87 |
| 54 59      | 1967 0  | 1 03 3  | 1 023 | 1 727 | 0 8  | 1 2 | 0 2 9 | 0 57 |
| 134 0      | 1968 0  | 1 76065 | 0 052 | 0 574 | 0 85 | 0 0 | 0 022 | 0 27 |
| 14 41      | 1969 0  | 1 54913 | 0 082 | 0 4 2 | 0 66 | 1 6 | 0 815 | 0 09 |
| 379 41     | 1970 0  | 33761   | 879   | 1 038 | 1 3  | 0 4 | 0 609 | 0 67 |
| 58 8       | 1971 0  | 0 895 3 | 1 677 | 1 654 | 3    | 0 9 | 0 40  | 0 38 |
| 138 3      | *1972 0 | 1 45 84 | 0 7 7 | 0 502 | 60   | 1 5 | 0 195 | 0 08 |
| 18 64      | 1973 0  | 1 413   | 0 736 | 0 349 | 0 40 | 1 3 | 0 104 | 78   |
| 383 64     | 1974 0  | 0 298   | 1 534 | 0 965 | 0 97 | 0 1 | 0 78  | 0 48 |
| 263 5      | 1975 0  | 0 58 4  | 0 563 | 1 581 | 1 54 | 6   | 575   | 0 19 |
| 14 46      | *1976 0 | 1 14504 | 1 361 | 0 4 9 | 0 34 | 1   | 0 369 | 0 77 |
| 87         | 1977 0  | 9335    | 1 390 | 0 76  | 0 14 | 1 0 | 0 78  | 0 59 |
| 387 87     | 1978 0  | 1 49114 | 42    | 0 892 | 0 71 | 1 5 | 0 071 | 0 9  |
| 267 8      | 1979 0  | 0 796   | 1 18  | 1 509 | 1 8  | 0 3 | 0 749 | 0    |
| 146 69     | *1980 0 | 837 4   | 0 47  | 0 356 | 0 08 | 0 9 | 0 54  | 0 58 |
| 7 1        | 1981 0  | 0 62572 | 0 77  | 3     | 1 65 | 0 7 | 0 451 | 0 40 |
| 39 10      | 1982 0  | 1 18334 | 1 74  | 0 82  | 0 45 | 1 2 | 0 45  | 0 10 |
| 271 51     | 1983 0  | 1 74 95 | 0 104 | 1 436 | 1 02 | 0 0 | 0 038 | 69   |
| 15 9       | *1984 0 | 0 52943 | 0 90  | 83    | 1 59 | 6   | 0 716 | 0 39 |
| 31 33      | 1985 0  | 0 31791 | 931   | 0 131 | 1 39 | 0 4 | 0 625 | 0 21 |
| 396 33     | 1986 0  | 87553   | 1 7 9 | 0 747 | 0 19 | 1 0 | 0 418 | 0 80 |
| 75 74      | 1987 0  | 43315   | 0 758 | 1 363 | 0 76 | 1 5 | 0 11  | 0 50 |
| 155 15     | 1988 0  | 163     | 1 556 | 0 11  | 1 33 | 0 3 | 0 005 | 0 20 |
| 35 56      | 1989 0  | 1011    | 1 585 | 0 058 | 1 14 | 1   | 798   | 0 02 |
| 4 56       | 1990 0  | 0 56773 | 0 615 | 674   | 1 71 | 0 7 | 591   | 0 61 |
| 279 97     | 1991 0  | 1 12535 | 1 413 | 1 9   | 51   | 1 2 | 0 385 | 0 31 |
| 159 38     | 1992 0  | 1 68 97 | 0 44  | 138   | 1 08 | 0 0 | 0 178 | 0 01 |
| 39 79      | 1993 0  | 1 47145 | 472   | 1 754 | 0 88 | 1 6 | 0 087 | 0 71 |
| 4 4 79     | 1994 0  | 5993    | 1 69  | 0 601 | 1 45 | 0 4 | 0 765 | 0 42 |
| 84 0       | 1995 0  | 0 81754 | 0 299 | 1 18  | 0 5  | 0 9 | 0 558 | 0 12 |
| 163 61     | 1996 0  | 1 37516 | 1 096 | 0 65  | 0 8  | 1 5 | 0 35  | 0 70 |
| 44         | 1997 0  | 1 16364 | 1 1 6 | 1 681 | 0 6  | 1 3 | 0 61  | 0 52 |
| 4 9        | 1998 0  | 1 7 1 6 | 0 156 | 0 529 | 1 19 | 1   | 0 54  | 0 2  |
| 88 43      | 1999 0  | 0 5 974 | 953   | 1 145 | 1 76 | 0 6 | 0 73  | 0 81 |
| 167 84     | *2000 0 | 1 06736 | 1 751 | 1 761 | 0 56 | 1 2 | 0 5 5 | 0 51 |
| 485 59     | P ods   | 1 76914 | 1 768 | 1 769 | 1 77 | 1 8 | 0 884 | 0 88 |

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

### X      Motions of Mean Longitude and the Arguments for Days

| 1                 | 2          | 3       | 4     | 5     | 6     | 7     | 8     |
|-------------------|------------|---------|-------|-------|-------|-------|-------|
| Day               | Mean Long. | A       | B     | C     | D     | E     | F—I   |
|                   | °          | d       | d     | d     | d     | d     | d     |
| <b>January 1</b>  | 203°48899  | 1°00000 | 1°000 | 1°000 | 1°000 | 1°000 | 1°00  |
| <b>2</b>          | 46°97798   | 2°00000 | 2°000 | 0°229 | 0°231 | 0°231 | 2°00  |
| <b>3</b>          | 250°46698  | 3°00000 | 0°650 | 1°229 | 1°231 | 1°231 | 3°00  |
| <b>4</b>          | 93°95597   | 0°47454 | 1°650 | 0°459 | 0°462 | 0°462 | 4°00  |
| <b>5</b>          | 297°44496  | 1°47454 | 0°299 | 1°459 | 1°462 | 1°462 | 5°00  |
| <b>6</b>          | 140°93395  | 2°47454 | 1°299 | 0°688 | 0°692 | 0°693 | 6°00  |
| <b>7</b>          | 344°42295  | 3°47454 | 2°299 | 1°688 | 1°692 | 1°693 | 7°00  |
| <b>8</b>          | 187°91194  | 0°94907 | 0°949 | 0°918 | 0°923 | 0°923 | 8°00  |
| <b>9</b>          | 31°40093   | 1°94907 | 1°949 | 0°147 | 0°154 | 0°154 | 9°00  |
| <b>10</b>         | 234°88992  | 2°94907 | 0°599 | 1°147 | 1°154 | 1°154 | 10°00 |
| <b>11</b>         | 78°37892   | 0°42361 | 1°599 | 0°377 | 0°385 | 0°385 | 11°00 |
| <b>12</b>         | 281°86791  | 1°42361 | 0°248 | 1°377 | 1°385 | 1°385 | 12°00 |
| <b>13</b>         | 125°35690  | 2°42361 | 1°248 | 0°606 | 0°616 | 0°616 | 13°00 |
| <b>14</b>         | 328°84589  | 3°42361 | 2°248 | 1°606 | 1°616 | 1°616 | 14°00 |
| <b>15</b>         | 172°33489  | 0°89815 | 0°898 | 0°836 | 0°846 | 0°847 | 15°00 |
| <b>16</b>         | 15°82388   | 1°89815 | 1°898 | 0°065 | 0°077 | 0°078 | 16°00 |
| <b>17</b>         | 219°31287  | 2°89815 | 0°548 | 1°065 | 1°077 | 1°078 | 17°00 |
| <b>18</b>         | 62°80186   | 0°37268 | 1°548 | 0°295 | 0°308 | 0°308 | 18°00 |
| <b>19</b>         | 266°29086  | 1°37268 | 0°198 | 1°295 | 1°308 | 1°308 | 19°00 |
| <b>20</b>         | 109°77985  | 2°37268 | 1°198 | 0°524 | 0°539 | 0°539 | 20°00 |
| <b>21</b>         | 313°26884  | 3°37268 | 2°198 | 1°524 | 1°539 | 1°539 | 21°00 |
| <b>22</b>         | 156°75783  | 0°84722 | 0°847 | 0°754 | 0°770 | 0°770 | 22°00 |
| <b>23</b>         | 0°24683    | 1°84722 | 1°847 | 1°754 | 0°000 | 0°001 | 23°00 |
| <b>24</b>         | 203°73582  | 2°84722 | 0°497 | 0°983 | 1°000 | 1°001 | 24°00 |
| <b>25</b>         | 47°22481   | 0°32176 | 1°497 | 0°213 | 0°231 | 0°232 | 25°00 |
| <b>26</b>         | 250°71380  | 1°32176 | 0°147 | 1°213 | 1°231 | 1°232 | 26°00 |
| <b>27</b>         | 94°20280   | 2°32176 | 1°147 | 0°442 | 0°462 | 0°463 | 27°00 |
| <b>28</b>         | 297°69179  | 3°32176 | 2°147 | 1°442 | 1°462 | 1°463 | 28°00 |
| <b>29</b>         | 141°18078  | 0°79629 | 0°796 | 0°672 | 0°693 | 0°694 | 29°00 |
| <b>30</b>         | 344°66977  | 1°79629 | 1°796 | 1°672 | 1°693 | 1°694 | 30°00 |
| <b>31</b>         | 188°15877  | 2°79629 | 0°446 | 0°901 | 0°924 | 0°924 | 31°00 |
| <b>February 1</b> | 31°64776   | 0°27083 | 1°446 | 0°131 | 0°154 | 0°155 | 32°00 |
| <b>2</b>          | 235°13675  | 1°27083 | 0°096 | 1°131 | 1°154 | 1°155 | 33°00 |
| <b>3</b>          | 78°62574   | 2°27083 | 1°096 | 0°360 | 0°385 | 0°386 | 34°00 |
| <b>4</b>          | 282°11474  | 3°27083 | 2°096 | 1°360 | 1°385 | 1°386 | 35°00 |
| <b>5</b>          | 125°60373  | 0°74536 | 0°745 | 0°590 | 0°616 | 0°617 | 36°00 |
| <b>6</b>          | 329°09272  | 1°74536 | 1°745 | 1°590 | 1°616 | 1°617 | 37°00 |
| <b>7</b>          | 172°58171  | 2°74536 | 0°395 | 0°819 | 0°847 | 0°848 | 38°00 |
| <b>8</b>          | 16°07070   | 0°21990 | 1°395 | 0°049 | 0°078 | 0°079 | 39°00 |
| <b>9</b>          | 219°55970  | 1°21990 | 0°045 | 1°049 | 1°078 | 1°079 | 40°00 |
| <b>10</b>         | 63°04869   | 2°21990 | 1°045 | 0°278 | 0°308 | 0°309 | 41°00 |
| <b>11</b>         | 266°53768  | 3°21990 | 2°045 | 1°278 | 1°308 | 1°309 | 42°00 |
| <b>12</b>         | 110°02667  | 0°69444 | 0°694 | 0°508 | 0°539 | 0°540 | 43°00 |
| <b>13</b>         | 313°51567  | 1°69444 | 1°694 | 1°508 | 1°539 | 1°540 | 44°00 |
| <b>14</b>         | 157°00466  | 2°69444 | 0°344 | 0°737 | 0°770 | 0°771 | 45°00 |
| <b>15</b>         | 0°49365    | 0°16897 | 1°344 | 1°737 | 0°001 | 0°002 | 46°00 |
| <b>16</b>         | 203°98264  | 1°16897 | 2°344 | 0°967 | 1°001 | 1°002 | 47°00 |
| <b>17</b>         | 47°47164   | 2°16897 | 0°994 | 0°196 | 0°232 | 0°233 | 48°00 |
| <b>18</b>         | 250°96063  | 3°16897 | 1°994 | 1°196 | 1°232 | 1°233 | 49°00 |
| <b>19</b>         | 94°44962   | 0°64351 | 0°644 | 0°426 | 0°462 | 0°464 | 50°00 |
| <b>20</b>         | 297°93861  | 1°64351 | 1°644 | 1°426 | 1°462 | 1°464 | 51°00 |
| <b>21</b>         | 141°42761  | 2°64351 | 0°293 | 0°655 | 0°693 | 0°695 | 52°00 |
| <b>22</b>         | 344°91660  | 0°11805 | 1°293 | 1°655 | 1°693 | 1°695 | 53°00 |

In Leap Year diminish the date in Columns 1, 9, by 1 day after Feb. 28

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

**X**      **Motions of Mean Longitude and the Arguments for Days**

| 9               |       |         |       | 3     | 4    | 5     | 6    |
|-----------------|-------|---------|-------|-------|------|-------|------|
| Day             | J     | K       | L     | M     | N O  | P     | Q    |
| <b>January</b>  |       |         |       |       | 1    |       |      |
| 1               | 0 003 | 1 0000  | 1 00  | 1 000 | 1 0  | 0 116 | 0 11 |
| 2               | 05    | 0 3086  | 3     | 0 231 | 3    | 0 31  | 0 23 |
| 3               | 0 008 | 1 3086  | 1 23  | 1 31  | 1 3  | 0 347 | 0 35 |
| 4               | 0 011 | 0 4617  | 0 464 | 46    | 0 46 | 463   | 0 46 |
| 5               | 0 14  | 1 4617  | 1 464 | 46    | 1 46 | 0 579 | 58   |
| 6               | 0 16  | 0 69259 | 0 696 | 0 693 | 0 69 | 0 694 | 0 69 |
| 7               | 0 019 | 1 69 59 | 1 696 | 1 693 | 1 69 | 0 810 | 0 81 |
| 8               | 0 022 | 9 345   | 9 8   | 925   | 9    | 0 042 | 0 04 |
| 9               | 0 05  | 0 15431 | 0 16  | 0 156 | 0 15 | 157   | 16   |
| 10              | 0 027 | 1 15431 | 1 160 | 1 156 | 1 15 | 73    | 0 7  |
| 11              | 0 030 | 0 38517 | 0 392 | 0 387 | 0 39 | 0 389 | 0 39 |
| 12              | 0 033 | 1 38517 | 1 39  | 1 387 | 1 39 | 0 5 4 | 0 5  |
| 13              | 0 036 | 0 61604 | 0 6 4 | 0 618 | 62   | 0 6   | 6    |
| 14              | 0 038 | 1 61604 | 1 624 | 1 618 | 1 62 | 0 736 | 0 73 |
| 15              | 0 041 | 84690   | 856   | 0 849 | 0 85 | 0 852 | 0 85 |
| 16              | 0 044 | 0 07776 | 0 88  | 0 080 | 0 08 | 0 083 | 0 8  |
| 17              | 0 047 | 1 07776 | 1 088 | 1 08  | 1 8  | 0 199 | 0 19 |
| 18              | 49    | 0 3086  | 0 320 | 0 311 | 31   | 0 314 | 31   |
| 19              | 0 052 | 1 30862 | 1 320 | 1 311 | 1 31 | 0 43  | 0 43 |
| 20              | 55    | 53948   | 0 55  | 0 543 | 0 54 | 546   | 54   |
| 21              | 0 58  | 1 53948 | 1 552 | 1 543 | 1 54 | 0 66  | 0 66 |
| 22              | 60    | 0 77035 | 0 784 | 0 774 | 0 77 | 0 777 | 0 77 |
| 23              | 0 063 | 0 00121 | 0 016 | 0 005 | 0 00 | 0 0 9 | 00   |
| 24              | 0 066 | 1 00121 | 1 016 | 1 05  | 1 0  | 0 1 5 | 0 1  |
| 25              | 68    | 0 3 07  | 0 248 | 0 236 | 0 3  | 0 40  | 0 3  |
| 26              | 71    | 1 3 7   | 1 48  | 1 36  | 1 3  | 0 356 | 0 35 |
| 27              | 0 74  | 46293   | 0 480 | 0 467 | 46   | 0 47  | 0 47 |
| 28              | 0 77  | 1 46 93 | 1 480 | 1 467 | 1 46 | 587   | 0 58 |
| 29              | 0 79  | 0 69380 | 0 71  | 0 698 | 0 69 | 0 703 | 0 7  |
| 30              | 08    | 1 69380 | 1 71  | 1 698 | 1 69 | 0 819 | 0 81 |
| 31              | 0 085 | 0 9 466 | 0 944 | 0 929 | 0 93 | 51    | 0 04 |
| <b>February</b> |       |         |       |       |      |       |      |
| 1               | 088   | 5552    | 176   | 0 161 | 0 16 | 0 166 | 0 16 |
| 2               | 090   | 1 1555  | 1 176 | 1 161 | 1 16 | 0 282 | 0 27 |
| 3               | 093   | 38638   | 0 4 9 | 0 39  | 0 39 | 0 397 | 0 39 |
| 4               | 096   | 1 38638 | 1 409 | 1 392 | 1 39 | 513   | 0 50 |
| 5               | 0 099 | 0 617 4 | 641   | 0 6 3 | 0 62 | 0 6 9 | 0 6  |
| 6               | 0 101 | 1 61724 | 1 641 | 1 6 3 | 1 62 | 0 745 | 0 74 |
| 7               | 0 104 | 0 84811 | 0 873 | 0 854 | 0 85 | 860   | 85   |
| 8               | 0 107 | 7897    | 0 1 5 | 0 085 | 0 08 | 09    | 0 08 |
| 9               | 0 11  | 1 07897 | 1 105 | 1 085 | 1 08 | 208   | 0 20 |
| 10              | 0 11  | 30983   | 337   | 0 316 | 0 31 | 0 3 3 | 0 32 |
| 11              | 0 115 | 1 3 983 | 1 337 | 1 316 | 1 31 | 439   | 0 43 |
| 12              | 0 118 | 0 54 69 | 569   | 0 548 | 0 54 | 555   | 54   |
| 13              | 0 1 1 | 1 54069 | 1 569 | 1 548 | 1 54 | 0 67  | 0 66 |
| 14              | 0 1 3 | 77155   | 0 8 1 | 0 779 | 0 77 | 0 786 | 0 78 |
| 15              | 0 126 | 0 00242 | 0 33  | 0 10  | 0 00 | 0 018 | 0 1  |
| 16              | 0 129 | 1 4     | 1 033 | 1 010 | 1 00 | 0 133 | 0 12 |
| 17              | 0 13  | 0 33 8  | 0 65  | 0 41  | 0 23 | 0 49  | 0 4  |
| 18              | 0 134 | 1 33 8  | 1 65  | 1 41  | 1 3  | 0 365 | 0 35 |
| 19              | 0 137 | 46414   | 0 497 | 0 47  | 0 47 | 0 480 | 0 47 |
| 20              | 0 140 | 1 46414 | 1 497 | 1 472 | 1 47 | 0 596 | 0 58 |
| 21              | 0 142 | 0 69500 | 0 7 9 | 0 703 | 0 70 | 0 712 | 0 70 |
| 22              | 0 145 | 1 69500 | 1 7 9 | 1 703 | 1 70 | 0 828 | 0 81 |

I L p Y d m l i l t h d t i C l m g b y d y f t F b 8

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1                  | 2          | 3       | 4     | 5     | 6     | 7     | 8      |
|--------------------|------------|---------|-------|-------|-------|-------|--------|
| Day                | Mean Long. | A       | B     | C     | D     | E     | F—I    |
|                    | °          | d       | d     | d     | d     | d     | d      |
| <b>February 23</b> | 188°40559  | 1°11805 | 2°293 | 0°885 | 0°924 | 0°925 | 54°00  |
| <b>24</b>          | 31°89458   | 2°11805 | 0°943 | 0°114 | 0°155 | 0°156 | 55°00  |
| <b>25</b>          | 235°38358  | 3°11805 | 1°943 | 1°114 | 1°155 | 1°156 | 56°00  |
| <b>26</b>          | 78°87257   | 0°59258 | 0°593 | 0°344 | 0°386 | 0°387 | 57°00  |
| <b>27</b>          | 282°36156  | 1°59258 | 1°593 | 1°344 | 1°386 | 1°387 | 58°00  |
| <b>March 28</b>    | 125°85055  | 2°59258 | 0°242 | 0°573 | 0°616 | 0°618 | 59°00  |
| <b>1</b>           | 329°33955  | 0°06712 | 1°242 | 1°573 | 1°616 | 1°618 | 60°00  |
| <b>2</b>           | 172°82854  | 1°06712 | 2°242 | 0°803 | 0°847 | 0°849 | 61°00  |
| <b>3</b>           | 16°31753   | 2°06712 | 0°892 | 0°032 | 0°078 | 0°080 | 62°00  |
| <b>4</b>           | 219°80652  | 3°06712 | 1°892 | 1°032 | 1°078 | 1°080 | 63°00  |
| <b>5</b>           | 63°29552   | 0°54166 | 0°542 | 0°262 | 0°309 | 0°310 | 64°00  |
| <b>6</b>           | 266°78451  | 1°54166 | 1°542 | 1°262 | 1°309 | 1°310 | 65°00  |
| <b>7</b>           | 110°27350  | 2°54166 | 0°191 | 0°491 | 0°540 | 0°541 | 66°00  |
| <b>8</b>           | 313°76249  | 0°01619 | 1°191 | 1°491 | 1°540 | 1°541 | 67°00  |
| <b>9</b>           | 157°25149  | 1°01619 | 2°191 | 0°721 | 0°770 | 0°772 | 68°00  |
| <b>10</b>          | 0°74048    | 2°01619 | 0°841 | 1°721 | 0°001 | 0°003 | 69°00  |
| <b>11</b>          | 204°22947  | 3°01619 | 1°841 | 0°950 | 1°001 | 1°003 | 70°00  |
| <b>12</b>          | 47°71846   | 0°49073 | 0°491 | 0°180 | 0°232 | 0°234 | 71°00  |
| <b>13</b>          | 251°20746  | 1°49073 | 1°491 | 1°180 | 1°232 | 1°234 | 72°00  |
| <b>14</b>          | 94°69645   | 2°49073 | 0°140 | 0°409 | 0°463 | 0°465 | 73°00  |
| <b>15</b>          | 298°18544  | 3°49073 | 1°140 | 1°409 | 1°463 | 1°465 | 74°00  |
| <b>16</b>          | 141°67443  | 0°96527 | 2°140 | 0°638 | 0°694 | 0°696 | 75°00  |
| <b>17</b>          | 345°16343  | 1°96527 | 0°790 | 1°638 | 1°694 | 1°696 | 76°00  |
| <b>18</b>          | 188°65242  | 2°96527 | 1°790 | 0°868 | 0°924 | 0°926 | 77°00  |
| <b>19</b>          | 32°14141   | 0°43980 | 0°440 | 0°097 | 0°155 | 0°157 | 78°00  |
| <b>20</b>          | 235°63040  | 1°43980 | 1°440 | 1°097 | 1°155 | 1°157 | 79°00  |
| <b>21</b>          | 79°11939   | 2°43980 | 0°089 | 0°327 | 0°386 | 0°388 | 80°00  |
| <b>22</b>          | 282°60839  | 3°43980 | 1°089 | 1°327 | 1°386 | 1°388 | 81°00  |
| <b>23</b>          | 126°09738  | 0°91434 | 2°089 | 0°556 | 0°617 | 0°619 | 82°00  |
| <b>24</b>          | 329°58637  | 1°91434 | 0°739 | 1°556 | 1°617 | 1°619 | 83°00  |
| <b>25</b>          | 173°07536  | 2°91434 | 1°739 | 0°786 | 0°848 | 0°850 | 84°00  |
| <b>26</b>          | 16°56436   | 0°38887 | 0°389 | 0°015 | 0°079 | 0°081 | 85°00  |
| <b>27</b>          | 220°05335  | 1°38887 | 1°389 | 1°015 | 1°079 | 1°081 | 86°00  |
| <b>28</b>          | 63°54234   | 2°38887 | 0°039 | 0°245 | 0°309 | 0°311 | 87°00  |
| <b>29</b>          | 267°03133  | 3°38887 | 1°039 | 1°245 | 1°309 | 1°311 | 88°00  |
| <b>April 30</b>    | 110°52033  | 0°86341 | 2°039 | 0°474 | 0°540 | 0°542 | 89°00  |
| <b>31</b>          | 314°00932  | 1°86341 | 0°688 | 1°474 | 1°540 | 1°542 | 90°00  |
| <b>1</b>           | 157°40831  | 2°86341 | 1°688 | 0°704 | 0°771 | 0°773 | 91°00  |
| <b>2</b>           | 0°98730    | 0°33795 | 0°338 | 1°704 | 0°002 | 0°004 | 92°00  |
| <b>3</b>           | 204°47630  | 1°33795 | 1°338 | 0°933 | 1°002 | 1°004 | 93°00  |
| <b>4</b>           | 47°96529   | 2°33795 | 2°338 | 0°163 | 0°233 | 0°235 | 94°00  |
| <b>5</b>           | 251°45428  | 3°33795 | 0°988 | 1°163 | 1°233 | 1°235 | 95°00  |
| <b>6</b>           | 94°94327   | 0°81248 | 1°988 | 0°392 | 0°463 | 0°466 | 96°00  |
| <b>7</b>           | 298°43227  | 1°81248 | 0°637 | 1°392 | 1°463 | 1°466 | 97°00  |
| <b>8</b>           | 141°92126  | 2°81248 | 1°637 | 0°622 | 0°694 | 0°697 | 98°00  |
| <b>9</b>           | 345°41025  | 0°28702 | 0°287 | 1°622 | 1°694 | 1°697 | 99°00  |
| <b>10</b>          | 188°89924  | 1°28702 | 1°287 | 0°851 | 0°925 | 0°927 | 100°00 |
| <b>11</b>          | 32°38824   | 2°28702 | 2°287 | 0°081 | 0°156 | 0°158 | 101°00 |
| <b>12</b>          | 235°87723  | 3°28702 | 0°937 | 1°081 | 1°156 | 1°158 | 102°00 |
| <b>13</b>          | 79°36622   | 0°76156 | 1°937 | 0°310 | 0°387 | 0°389 | 103°00 |
| <b>14</b>          | 282°85521  | 1°76156 | 0°586 | 1°310 | 1°387 | 1°389 | 104°00 |
| <b>15</b>          | 126°34421  | 2°76156 | 1°586 | 0°540 | 0°617 | 0°620 | 105°00 |
| <b>16</b>          | 329°83320  | 0°23609 | 0°236 | 1°540 | 1°617 | 1°620 | 106°00 |

In Leap Year diminish the date in Columns 1, 9, by 1 day after Feb. 28.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 9                  |       |          |       | 3     | 4    | 5     | 6    |
|--------------------|-------|----------|-------|-------|------|-------|------|
| Day                | J     | K        | L     | M     | N O  | P     | Q    |
|                    | y     | l        |       | a     | d    | d     | l    |
| <b>February 23</b> | 0 148 | 09 587   | 0961  | 0934  | 093  | 0 59  | 005  |
| <b>24</b>          | 0 151 | 0 15673  | 0 193 | 0 166 | 0 16 | 0 175 | 0 16 |
| <b>25</b>          | 153   | 1 15673  | 1 93  | 1 166 | 1 16 | 0 291 | 28   |
| <b>26</b>          | 0 156 | 38759    | 0 425 | 397   | 0 39 | 0 406 | 0 39 |
| <b>27</b>          | 0 159 | 1 38759  | 1 425 | 1 397 | 1 39 | 0 522 | 0 51 |
| <b>28</b>          | 0 16  | 0 61845  | 0 657 | 0 6 8 | 0 6  | 0 638 | 62   |
| <b>March 1</b>     | 0 164 | 1 61845  | 1 657 | 1 628 | 1 6  | 0 753 | 0 74 |
| <b>2</b>           | 0 167 | 0 84931  | 889   | 0 859 | 0 85 | 0 869 | 0 85 |
| <b>3</b>           | 0 170 | 0 8018   | 0 1 1 | 0 09  | 0 08 | 0 101 | 0 09 |
| <b>4</b>           | 0 173 | 1 08018  | 1 121 | 1 90  | 1 08 | 0 216 | 20   |
| <b>5</b>           | 175   | 3 1104   | 0 353 | 0 321 | 3 1  | 0 33  | 0 3  |
| <b>6</b>           | 178   | 1 3 1104 | 1 353 | 1 321 | 1 31 | 0 448 | 43   |
| <b>7</b>           | 0 181 | 0 54190  | 0 585 | 0 55  | 0 54 | 0 563 | 0 55 |
| <b>8</b>           | 0 184 | 1 54190  | 1 585 | 1 55  | 1 54 | 0 679 | 0 66 |
| <b>9</b>           | 0 186 | 0 77 76  | 817   | 784   | 0 78 | 0 795 | 0 78 |
| <b>10</b>          | 0 189 | 0 363    | 0 049 | 0 015 | 0 01 | 0 0 6 | 0 01 |
| <b>11</b>          | 0 19  | 1 00363  | 1 49  | 1 015 | 1 01 | 0 14  | 0 1  |
| <b>12</b>          | 0 195 | 0 23449  | 0 81  | 0 46  | 0 24 | 0 258 | 0 4  |
| <b>13</b>          | 0 197 | 1 23449  | 1 81  | 1 246 | 1 4  | 0 374 | 0 36 |
| <b>14</b>          | 200   | 0 46535  | 0 513 | 0 477 | 0 47 | 0 489 | 0 47 |
| <b>15</b>          | 0 2 3 | 1 46535  | 1 513 | 1 477 | 1 47 | 0 605 | 0 59 |
| <b>16</b>          | 0 205 | 0 69621  | 0 745 | 0 708 | 0 70 | 0 721 | 0 70 |
| <b>17</b>          | 8     | 1 696 1  | 1 745 | 1 708 | 1 70 | 0 836 | 0 82 |
| <b>18</b>          | 0 11  | 0 92707  | 0 977 | 0 939 | 0 93 | 0 68  | 0 05 |
| <b>19</b>          | 0 14  | 0 15794  | 0 209 | 0 170 | 0 16 | 0 184 | 0 16 |
| <b>20</b>          | 0 16  | 1 15794  | 1 209 | 1 170 | 1 16 | 299   | 0 28 |
| <b>21</b>          | 0 219 | 0 38880  | 441   | 0 40  | 0 39 | 0 415 | 0 40 |
| <b>22</b>          | 0 222 | 1 38880  | 1 441 | 1 402 | 1 39 | 0 531 | 0 51 |
| <b>23</b>          | 0 2 5 | 0 61966  | 0 673 | 0 633 | 0 62 | 0 646 | 0 63 |
| <b>24</b>          | 227   | 1 61966  | 1 673 | 1 633 | 1 62 | 0 762 | 0 74 |
| <b>25</b>          | 0 30  | 0 85052  | 905   | 0 864 | 85   | 878   | 86   |
| <b>26</b>          | 0 233 | 0 08139  | 0 137 | 0 095 | 0 08 | 0 109 | 09   |
| <b>27</b>          | 0 236 | 1 08139  | 1 137 | 1 095 | 1 08 | 0 5   | 0 20 |
| <b>28</b>          | 38    | 0 312 5  | 0 369 | 3 6   | 0 3  | 0 341 | 0 32 |
| <b>29</b>          | 41    | 1 31 25  | 1 369 | 1 326 | 1 3  | 457   | 0 43 |
| <b>30</b>          | 0 44  | 0 54311  | 0 601 | 0 557 | 0 55 | 0 57  | 0 55 |
| <b>31</b>          | 0 47  | 1 54311  | 1 601 | 1 557 | 1 55 | 0 688 | 0 67 |
| <b>April 1</b>     | 0 249 | 77397    | 0 833 | 0 787 | 0 78 | 804   | 0 78 |
| <b>2</b>           | 0 252 | 0 483    | 65    | 0     | 0 01 | 0 35  | 0 0  |
| <b>3</b>           | 255   | 1 0483   | 1 65  | 1 20  | 1 01 | 0 151 | 0 13 |
| <b>4</b>           | 0 58  | 0 3570   | 0 297 | 0 51  | 0 4  | 0 67  | 0 24 |
| <b>5</b>           | 0 60  | 1 2357   | 1 97  | 1 51  | 1 4  | 38    | 0 36 |
| <b>6</b>           | 63    | 0 46656  | 0 529 | 0 48  | 0 47 | 0 498 | 0 47 |
| <b>7</b>           | 66    | 1 46656  | 1 5 9 | 1 48  | 1 47 | 0 614 | 0 59 |
| <b>8</b>           | 268   | 0 6974   | 0 761 | 0 713 | 70   | 0 7 9 | 0 71 |
| <b>9</b>           | 27    | 1 69742  | 1 761 | 1 713 | 1 70 | 0 845 | 0 82 |
| <b>10</b>          | 274   | 9 828    | 0 994 | 0 944 | 0 93 | 0 77  | 0 05 |
| <b>11</b>          | 0 77  | 0 15915  | 0 2 6 | 175   | 0 16 | 0 192 | 0 17 |
| <b>12</b>          | 0 79  | 1 15915  | 1 2 6 | 1 175 | 1 16 | 0 308 | 0 28 |
| <b>13</b>          | 0 82  | 0 39 1   | 0 458 | 0 407 | 0 39 | 0 424 | 0 40 |
| <b>14</b>          | 0 285 | 1 39001  | 1 458 | 1 407 | 1 39 | 0 540 | 0 51 |
| <b>15</b>          | 0 288 | 0 6 087  | 690   | 0 638 | 0 62 | 0 655 | 0 63 |
| <b>16</b>          | 0 290 | 1 62087  | 1 690 | 1 638 | 1 62 | 0 771 | 0 74 |



# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

**X continued**      **Motions of Mean Longitude and the Arguments for Days**

| 1     |    | 2          | 3       | 4     | 5     | 6     | 7     | 8      |
|-------|----|------------|---------|-------|-------|-------|-------|--------|
| Day   |    | Mean Long. | A       | B     | C     | D     | E     | F—I    |
|       |    | °          | d       | d     | d     | d     | d     | d      |
| April | 17 | 173°32219  | 1°23609 | 1°236 | 0°769 | 0°848 | 0°851 | 107°00 |
|       | 18 | 16°81118   | 2°23609 | 2°236 | 1°769 | 0°079 | 0°082 | 108°00 |
|       | 19 | 220°30018  | 3°23609 | 0°886 | 0°999 | 1°079 | 1°082 | 109°00 |
|       | 20 | 63°78917   | 0°71063 | 1°886 | 0°228 | 0°310 | 0°312 | 110°00 |
|       | 21 | 267°27816  | 1°71063 | 0°535 | 1°228 | 1°310 | 1°312 | 111°00 |
|       | 22 | 110°76715  | 2°71063 | 1°535 | 0°458 | 0°541 | 0°543 | 112°00 |
|       | 23 | 314°25615  | 0°18517 | 0°185 | 1°458 | 1°541 | 1°543 | 113°00 |
|       | 24 | 157°74514  | 1°18517 | 1°185 | 0°687 | 0°771 | 0°774 | 114°00 |
|       | 25 | 1°23413    | 2°18517 | 2°185 | 1°687 | 0°002 | 0°005 | 115°00 |
|       | 26 | 204°72312  | 3°18517 | 0°835 | 0°917 | 1°002 | 1°005 | 116°00 |
|       | 27 | 48°21211   | 0°65970 | 1°835 | 0°146 | 0°233 | 0°236 | 117°00 |
| May   | 28 | 251°70111  | 1°65970 | 0°485 | 1°146 | 1°233 | 1°236 | 118°00 |
|       | 29 | 95°19010   | 2°65970 | 1°485 | 0°376 | 0°464 | 0°467 | 119°00 |
|       | 30 | 298°67909  | 0°13424 | 0°134 | 1°376 | 1°464 | 1°467 | 120°00 |
|       | 1  | 142°16808  | 1°13424 | 1°134 | 0°605 | 0°695 | 0°698 | 121°00 |
|       | 2  | 345°65708  | 2°13424 | 2°134 | 1°605 | 1°695 | 1°698 | 122°00 |
|       | 3  | 189°14607  | 3°13424 | 0°784 | 0°835 | 0°925 | 0°928 | 123°00 |
|       | 4  | 32°63506   | 0°60878 | 1°784 | 0°064 | 0°156 | 0°159 | 124°00 |
|       | 5  | 236°12405  | 1°60878 | 0°434 | 1°064 | 1°156 | 1°159 | 125°00 |
|       | 6  | 79°61305   | 2°60878 | 1°434 | 0°294 | 0°387 | 0°390 | 126°00 |
|       | 7  | 283°10204  | 0°08331 | 0°083 | 1°294 | 1°387 | 1°390 | 127°00 |
|       | 8  | 126°59103  | 1°08331 | 1°083 | 0°523 | 0°618 | 0°621 | 128°00 |
|       | 9  | 330°08002  | 2°08331 | 2°083 | 1°523 | 1°618 | 1°621 | 129°00 |
|       | 10 | 173°56902  | 3°08331 | 0°733 | 0°753 | 0°849 | 0°852 | 130°00 |
|       | 11 | 17°05801   | 0°55785 | 1°733 | 1°753 | 0°079 | 0°083 | 131°00 |
|       | 12 | 220°54700  | 1°55785 | 0°383 | 0°982 | 1°079 | 1°083 | 132°00 |
|       | 13 | 64°03599   | 2°55785 | 1°383 | 0°212 | 0°310 | 0°313 | 133°00 |
|       | 14 | 267°52499  | 0°03238 | 0°032 | 1°212 | 1°310 | 1°313 | 134°00 |
|       | 15 | 111°01398  | 1°03238 | 1°032 | 0°441 | 0°541 | 0°544 | 135°00 |
|       | 16 | 314°50297  | 2°03238 | 2°032 | 1°441 | 1°541 | 1°544 | 136°00 |
|       | 17 | 157°99196  | 3°03238 | 0°682 | 0°671 | 0°772 | 0°775 | 137°00 |
|       | 18 | 1°48096    | 0°50692 | 1°682 | 1°671 | 0°003 | 0°006 | 138°00 |
|       | 19 | 204°96995  | 1°50692 | 0°332 | 0°900 | 1°003 | 1°006 | 139°00 |
|       | 20 | 48°45894   | 2°50692 | 1°332 | 0°130 | 0°233 | 0°237 | 140°00 |
|       | 21 | 251°94793  | 3°50692 | 2°332 | 1°130 | 1°233 | 1°237 | 141°00 |
|       | 22 | 95°43693   | 0°98146 | 0°981 | 0°359 | 0°464 | 0°468 | 142°00 |
|       | 23 | 298°92592  | 1°98146 | 1°981 | 1°359 | 1°464 | 1°468 | 143°00 |
|       | 24 | 142°41491  | 2°98146 | 0°631 | 0°589 | 0°695 | 0°699 | 144°00 |
|       | 25 | 345°90390  | 0°45599 | 1°631 | 1°589 | 1°695 | 1°699 | 145°00 |
|       | 26 | 189°39290  | 1°45599 | 0°281 | 0°818 | 0°926 | 0°929 | 146°00 |
|       | 27 | 32°88189   | 2°45599 | 1°281 | 0°048 | 0°157 | 0°160 | 147°00 |
|       | 28 | 236°37088  | 3°45599 | 2°281 | 1°048 | 1°157 | 1°160 | 148°00 |
|       | 29 | 79°85987   | 0°93053 | 0°931 | 0°277 | 0°387 | 0°391 | 149°00 |
|       | 30 | 283°34887  | 1°93053 | 1°931 | 1°277 | 1°387 | 1°391 | 150°00 |
|       | 31 | 126°83786  | 2°93053 | 0°580 | 0°506 | 0°618 | 0°622 | 151°00 |
| June  | 1  | 330°32685  | 0°40507 | 1°580 | 1°506 | 1°618 | 1°622 | 152°00 |
|       | 2  | 173°81584  | 1°40507 | 0°230 | 0°736 | 0°849 | 0°853 | 153°00 |
|       | 3  | 17°30483   | 2°40507 | 1°230 | 1°736 | 0°080 | 0°084 | 154°00 |
|       | 4  | 220°79383  | 3°40507 | 2°230 | 0°965 | 1°080 | 1°084 | 155°00 |
|       | 5  | 64°28282   | 0°87960 | 0°880 | 0°195 | 0°311 | 0°314 | 156°00 |
|       | 6  | 267°77181  | 1°87960 | 1°880 | 1°195 | 1°311 | 1°314 | 157°00 |
|       | 7  | 111°26080  | 2°87960 | 0°529 | 0°424 | 0°541 | 0°545 | 158°00 |

In Leap Year diminish the date in Columns 1, 9, by 1 day after Feb. 28.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 9            |          |       |         |       | 3     | 4    | 5     | 6    |
|--------------|----------|-------|---------|-------|-------|------|-------|------|
| Day          |          | J     | K       | L     | M     | N, O | P     | Q    |
| <b>April</b> |          |       | 1       |       |       |      | d     | d    |
| 17           |          | 0 93  | 0 85173 | 0 9 2 | 0 869 | 0 86 | 0 02  | 0 86 |
| 18           |          | 0 96  | 0 08 59 | 0 154 | 0 1   | 0 09 | 0 118 | 0 9  |
| 19           |          | 99    | 1 08 59 | 1 154 | 1 1   | 1 9  | 34    | 0 1  |
| 20           |          | 0 3 1 | 3 1346  | 0 386 | 0 331 | 0 3  | 35    | 0 32 |
| 21           |          | 3 4   | 1 31346 | 1 386 | 1 331 | 1 3  | 0 465 | 44   |
| 22           |          | 307   | 0 5443  | 618   | 0 56  | 55   | 0 581 | 55   |
| 23           |          | 310   | 1 5443  | 1 618 | 1 562 | 1 55 | 0 697 | 0 67 |
| 24           |          | 0 31  | 0 77518 | 0 850 | 0 793 | 0 78 | 0 81  | 78   |
| 25           |          | 0 315 | 0 0604  | 0 08  | 0 5   | 0 1  | 0 044 | 0    |
| 26           |          | 0 318 | 1 00604 | 1 8   | 1 5   | 1 01 | 0 160 | 0 13 |
| 27           |          | 3 1   | 3 691   | 314   | 0 256 | 0 24 | 0 75  | 0 25 |
| 28           |          | 0 3 3 | 1 3691  | 1 314 | 1 56  | 1 4  | 0 391 | 36   |
| 29           |          | 326   | 0 46777 | 0 546 | 0 487 | 0 47 | 0 507 | 0 48 |
| 30           |          | 3 9   | 1 46777 | 1 546 | 1 487 | 1 47 | 0 6 3 | 0 59 |
| <b>May</b>   | <b>1</b> | 0 33  | 0 69863 | 0 778 | 0 718 | 0 70 | 0 738 | 0 71 |
| 2            |          | 334   | 1 69863 | 0 010 | 1 718 | 1 70 | 854   | 0 82 |
| 3            |          | 0 337 | 9 949   | 1 010 | 0 949 | 0 93 | 0 085 | 0 05 |
| 4            |          | 0 34  | 0 16035 | 24    | 0 18  | 0 16 | 0 201 | 0 17 |
| 5            |          | 0 342 | 1 16035 | 1 4   | 1 18  | 1 16 | 0 317 | 29   |
| 6            |          | 0 345 | 391 2   | 0 474 | 0 411 | 0 40 | 0 433 | 0 40 |
| 7            |          | 0 348 | 1 39122 | 1 474 | 1 411 | 1 40 | 0 548 | 0 5  |
| 8            |          | 0 351 | 0 62 08 | 706   | 643   | 0 63 | 0 664 | 0 63 |
| 9            |          | 0 353 | 1 6 8   | 1 706 | 1 643 | 1 63 | 0 780 | 0 75 |
| 10           |          | 356   | 85 94   | 0 938 | 874   | 0 86 | 0 11  | 0 86 |
| 11           |          | 0 359 | 0 08380 | 17    | 1 5   | 0 09 | 127   | 0 09 |
| 12           |          | 0 36  | 1 08380 | 1 170 | 1 105 | 1 09 | 0 43  | 0 1  |
| 13           |          | 0 364 | 0 31466 | 0 40  | 336   | 0 3  | 0 358 | 0 33 |
| 14           |          | 367   | 1 31466 | 1 40  | 1 336 | 1 32 | 0 474 | 0 44 |
| 15           |          | 37    | 0 54553 | 0 634 | 567   | 55   | 0 590 | 0 56 |
| 16           |          | 373   | 1 54553 | 1 634 | 1 567 | 1 55 | 706   | 0 67 |
| 17           |          | 0 375 | 0 77639 | 0 866 | 0 798 | 78   | 0 8 1 | 0 79 |
| 18           |          | 378   | 0 725   | 0 98  | 0 029 | 0 1  | 0 53  | 0 02 |
| 19           |          | 381   | 1 007 5 | 1 098 | 1 0 9 | 1 01 | 0 168 | 0 13 |
| 20           |          | 384   | 0 3811  | 33    | 0 61  | 0 4  | 0 284 | 0 25 |
| 21           |          | 386   | 1 3811  | 1 33  | 1 61  | 1 24 | 0 400 | 0 36 |
| 22           |          | 389   | 0 46898 | 0 56  | 49    | 0 47 | 516   | 0 48 |
| 23           |          | 39    | 1 46898 | 1 562 | 1 492 | 1 47 | 631   | 0 60 |
| 24           |          | 0 395 | 0 69984 | 0 794 | 0 7 3 | 7    | 0 747 | 71   |
| 25           |          | 397   | 1 69984 | 6     | 1 723 | 1 70 | 863   | 0 83 |
| 26           |          | 0 40  | 0 93070 | 1 6   | 0 954 | 94   | 0 94  | 0 6  |
| 27           |          | 403   | 0 16156 | 0 58  | 185   | 0 17 | 0 10  | 0 17 |
| 28           |          | 0 4 5 | 1 16156 | 1 58  | 1 185 | 1 17 | 0 3 6 | 0 29 |
| 29           |          | 0 408 | 0 39242 | 0 490 | 0 416 | 40   | 0 441 | 0 40 |
| 30           |          | 0 411 | 1 39 4  | 1 490 | 1 416 | 1 40 | 0 557 | 0 52 |
| 31           |          | 414   | 0 6 3 9 | 0 7 2 | 0 647 | 0 63 | 673   | 0 64 |
| <b>June</b>  | <b>1</b> | 0 416 | 1 6 3 9 | 1 7   | 1 647 | 1 63 | 0 789 | 0 75 |
| 2            |          | 0 419 | 0 85415 | 0 954 | 0 879 | 86   | 0 0 0 | 0 87 |
| 3            |          | 0 4 2 | 0 08501 | 0 186 | 0 110 | 0 9  | 0 136 | 0 10 |
| 4            |          | 4 5   | 1 8501  | 1 186 | 1 110 | 1 09 | 0 51  | 0 1  |
| 5            |          | 0 427 | 3 1587  | 0 418 | 0 341 | 0 32 | 0 367 | 0 33 |
| 6            |          | 430   | 1 31587 | 1 418 | 1 341 | 1 32 | 0 483 | 0 44 |
| 7            |          | 0 433 | 0 54674 | 650   | 0 57  | 55   | 0 599 | 0 56 |

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1           | 2          | 3       | 4     | 5     | 6     | 7     | 8      |
|-------------|------------|---------|-------|-------|-------|-------|--------|
| Day         | Mean Long. | A       | B     | C     | D     | E     | F—I    |
| <b>June</b> |            | d       | d     | d     | d     | d     | d      |
| 8           | 314°74980  | 0°35414 | 1°529 | 1°424 | 1°541 | 1°545 | 159°00 |
| 9           | 158°23879  | 1°35414 | 0°179 | 0°654 | 0°772 | 0°776 | 160°00 |
| 10          | 1°72778    | 2°35414 | 1°179 | 1°654 | 0°003 | 0°007 | 161°00 |
| 11          | 205°21677  | 3°35414 | 2°179 | 0°883 | 1°003 | 1°007 | 162°00 |
| 12          | 48°70577   | 0°82868 | 0°829 | 0°113 | 0°234 | 0°238 | 163°00 |
| 13          | 252°19476  | 1°82868 | 1°829 | 1°113 | 1°234 | 1°238 | 164°00 |
| 14          | 95°68375   | 2°82868 | 0°478 | 0°342 | 0°465 | 0°469 | 165°00 |
| 15          | 299°17274  | 0°30321 | 1°478 | 1°342 | 1°465 | 1°469 | 166°00 |
| 16          | 142°66174  | 1°30321 | 0°128 | 0°572 | 0°695 | 0°700 | 167°00 |
| 17          | 346°15073  | 2°30321 | 1°128 | 1°572 | 1°695 | 1°700 | 168°00 |
| 18          | 189°63972  | 3°30321 | 2°128 | 0°801 | 0°926 | 0°930 | 169°00 |
| 19          | 33°12871   | 0°77775 | 0°778 | 0°031 | 0°157 | 0°161 | 170°00 |
| 20          | 236°61771  | 1°77775 | 1°778 | 1°031 | 1°157 | 1°161 | 171°00 |
| 21          | 80°10670   | 2°77775 | 0°427 | 0°260 | 0°388 | 0°392 | 172°00 |
| 22          | 283°59569  | 0°25229 | 1°427 | 1°260 | 1°388 | 1°392 | 173°00 |
| 23          | 127°08468  | 1°25229 | 0°077 | 0°490 | 0°619 | 0°623 | 174°00 |
| 24          | 330°57368  | 2°25229 | 1°077 | 1°490 | 1°619 | 1°623 | 175°00 |
| 25          | 174°06267  | 3°25229 | 2°077 | 0°719 | 0°849 | 0°854 | 176°00 |
| 26          | 17°55166   | 0°72682 | 0°727 | 1°719 | 0°080 | 0°085 | 177°00 |
| 27          | 221°04065  | 1°72682 | 1°727 | 0°949 | 1°080 | 1°085 | 178°00 |
| 28          | 64°52965   | 2°72682 | 0°377 | 0°178 | 0°311 | 0°315 | 179°00 |
| 29          | 268°01864  | 0°20136 | 1°377 | 1°178 | 1°311 | 1°315 | 180°00 |
| 30          | 111°50763  | 1°20136 | 0°026 | 0°408 | 0°542 | 0°546 | 181°00 |
| <b>July</b> |            |         |       |       |       |       |        |
| 1           | 314°99662  | 2°20136 | 1°026 | 1°408 | 1°542 | 1°546 | 182°00 |
| 2           | 158°48562  | 3°20136 | 2°026 | 0°637 | 0°773 | 0°777 | 183°00 |
| 3           | 1°97461    | 0°67589 | 0°676 | 1°637 | 0°003 | 0°008 | 184°00 |
| 4           | 205°46360  | 1°67589 | 1°676 | 0°867 | 1°003 | 1°008 | 185°00 |
| 5           | 48°95259   | 2°67589 | 0°326 | 0°096 | 0°234 | 0°239 | 186°00 |
| 6           | 252°44159  | 0°15043 | 1°326 | 1°096 | 1°234 | 1°239 | 187°00 |
| 7           | 95°93058   | 1°15043 | 2°326 | 0°326 | 0°465 | 0°470 | 188°00 |
| 8           | 299°41957  | 2°15043 | 0°975 | 1°326 | 1°465 | 1°470 | 189°00 |
| 9           | 142°90856  | 3°15043 | 1°975 | 0°555 | 0°696 | 0°701 | 190°00 |
| 10          | 346°39756  | 0°62497 | 0°625 | 1°555 | 1°696 | 1°701 | 191°00 |
| 11          | 189°88655  | 1°62497 | 1°625 | 0°785 | 0°927 | 0°931 | 192°00 |
| 12          | 33°37554   | 2°62497 | 0°275 | 0°014 | 0°157 | 0°162 | 193°00 |
| 13          | 236°86453  | 0°09950 | 1°275 | 1°014 | 1°157 | 1°162 | 194°00 |
| 14          | 80°35352   | 1°09950 | 2°275 | 0°244 | 0°388 | 0°393 | 195°00 |
| 15          | 283°84252  | 2°09950 | 0°924 | 1°244 | 1°388 | 1°393 | 196°00 |
| 16          | 127°33151  | 3°09950 | 1°924 | 0°473 | 0°619 | 0°624 | 197°00 |
| 17          | 330°82050  | 0°57404 | 0°574 | 1°473 | 1°619 | 1°624 | 198°00 |
| 18          | 174°30949  | 1°57404 | 1°574 | 0°703 | 0°850 | 0°855 | 199°00 |
| 19          | 17°79849   | 2°57404 | 0°224 | 1°703 | 0°081 | 0°086 | 200°00 |
| 20          | 221°28748  | 0°04858 | 1°224 | 0°932 | 1°081 | 1°086 | 201°00 |
| 21          | 64°77647   | 1°04858 | 2°224 | 0°162 | 0°311 | 0°316 | 202°00 |
| 22          | 268°26546  | 2°04858 | 0°873 | 1°162 | 1°311 | 1°316 | 203°00 |
| 23          | 111°75446  | 3°04858 | 1°873 | 0°391 | 0°542 | 0°547 | 204°00 |
| 24          | 315°24345  | 0°52311 | 0°523 | 1°391 | 1°542 | 1°547 | 205°00 |
| 25          | 158°73244  | 1°52311 | 1°523 | 0°621 | 0°773 | 0°778 | 206°00 |
| 26          | 2°22143    | 2°52311 | 0°173 | 1°621 | 0°004 | 0°009 | 207°00 |
| 27          | 205°71043  | 3°52311 | 1°173 | 0°851 | 1°004 | 1°009 | 208°00 |
| 28          | 49°19942   | 0°99765 | 2°173 | 0°080 | 0°235 | 0°240 | 209°00 |
| 29          | 252°68841  | 1°99765 | 0°822 | 1°080 | 1°235 | 1°240 | 210°00 |

In Leap Year diminish the date in Columns 2, 9, by 1 day after Feb. 28.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 9           |   |       |         | 3     | 4     | 5    | 6     |
|-------------|---|-------|---------|-------|-------|------|-------|
| D y         |   | J     | K       | L     | M     | N O  | P Q   |
| <b>June</b> |   | y     | d       | l     |       |      | d     |
| 8           |   | 0 436 | 1 54674 | 1 65  | 1 57  | 1 55 | 0 714 |
| 9           |   | 0 438 | 0 77760 | 0 882 | 0 803 | 0 78 | 0 830 |
| 10          |   | 0 441 | 0 00846 | 0 114 | 34    | 0 01 | 0 061 |
| 11          |   | 0 444 | 1 0 846 | 1 114 | 1 034 | 1 01 | 0 177 |
| 12          |   | 0 447 | 393     | 346   | 0 66  | 0 4  | 93    |
| 13          |   | 0 449 | 1 2393  | 1 346 | 1 66  | 1 4  | 0 409 |
| 14          |   | 0 45  | 0 47 18 | 0 579 | 497   | 0 48 | 0 5 4 |
| 15          |   | 0 455 | 1 47018 | 1 579 | 1 497 | 1 48 | 0 640 |
| 16          |   | 0 458 | 0 7 105 | 0 811 | 0 7 8 | 0 71 | 0 756 |
| 17          |   | 460   | 1 701 5 | 0 43  | 1 7 8 | 1 71 | 0 87  |
| 18          |   | 463   | 0 93191 | 1 043 | 0 959 | 0 94 | 0 103 |
| 19          |   | 0 466 | 0 16 77 | 0 275 | 0 190 | 17   | 0 19  |
| 20          |   | 0 468 | 1 16 77 | 1 75  | 1 190 | 1 17 | 0 334 |
| 21          |   | 0 471 | 0 39363 | 0 507 | 0 4 1 | 0 40 | 450   |
| 22          |   | 0 474 | 1 39363 | 1 507 | 1 4 1 | 1 40 | 0 566 |
| 23          |   | 0 477 | 0 6 450 | 0 739 | 0 65  | 0 63 | 0 68  |
| 24          |   | 0 479 | 1 6 450 | 1 739 | 1 65  | 1 63 | 0 797 |
| 25          |   | 48    | 0 85536 | 0 971 | 0 884 | 0 86 | 0 29  |
| 26          |   | 0 485 | 0 086 2 | 0 2 3 | 0 115 | 0 09 | 0 144 |
| 27          |   | 0 488 | 1 086   | 1 03  | 1 115 | 1 09 | 0 260 |
| 28          |   | 0 490 | 317 8   | 0 435 | 0 346 | 0 3  | 0 376 |
| 29          |   | 0 493 | 1 31708 | 1 435 | 1 346 | 1 3  | 0 492 |
| 30          |   | 496   | 0 54794 | 0 667 | 0 577 | 55   | 0 607 |
| <b>July</b> | 1 | 499   | 1 54794 | 1 667 | 1 577 | 1 55 | 0 7 3 |
|             | 2 | 0 5 1 | 0 77881 | 0 899 | 0 808 | 0 79 | 0 839 |
| 3           |   | 5 4   | 0 00967 | 0 131 | 0 039 | 0    | 7     |
| 4           |   | 507   | 1 0 967 | 1 131 | 1 039 | 1 0  | 186   |
| 5           |   | 0 510 | 4053    | 363   | 0 27  | 0 5  | 0 3   |
| 6           |   | 0 512 | 1 4053  | 1 363 | 1 270 | 1 5  | 0 417 |
| 7           |   | 0 515 | 0 47139 | 595   | 0 50  | 0 48 | 0 533 |
| 8           |   | 0 518 | 1 47139 | 1 595 | 1 50  | 1 48 | 0 649 |
| 9           |   | 0 5   | 70 6    | 8 7   | 0 733 | 0 71 | 0 765 |
| 10          |   | 0 5 3 | 1 70 6  | 0 59  | 1 733 | 1 71 | 0 880 |
| 11          |   | 0 526 | 0 9331  | 1 59  | 0 964 | 0 94 | 0 11  |
| 12          |   | 0 5 9 | 1 6398  | 0 91  | 0 195 | 17   | 0 2 7 |
| 13          |   | 0 532 | 1 16398 | 1 291 | 1 195 | 1 17 | 0 343 |
| 14          |   | 0 534 | 0 39484 | 0 5 3 | 4 6   | 0 40 | 0 459 |
| 15          |   | 537   | 1 39484 | 1 5 3 | 1 4 6 | 1 40 | 0 575 |
| 16          |   | 0 540 | 6 570   | 755   | 657   | 63   | 0 690 |
| 17          |   | 0 54  | 1 6 57  | 1 755 | 1 657 | 1 63 | 806   |
| 18          |   | 0 545 | 0 85657 | 0 987 | 0 888 | 0 86 | 0 038 |
| 19          |   | 0 548 | 0 8743  | 0 219 | 1 0   | 0 09 | 0 153 |
| 20          |   | 0 551 | 1 08743 | 1 19  | 1 1 0 | 1 09 | 69    |
| 21          |   | 553   | 318 9   | 0 451 | 0 351 | 0 33 | 0 385 |
| 22          |   | 556   | 1 318 9 | 1 451 | 1 351 | 1 33 | 0 5 0 |
| 23          |   | 0 559 | 0 549 5 | 683   | 0 58  | 0 56 | 0 616 |
| 24          |   | 0 56  | 1 54915 | 1 683 | 1 58  | 1 56 | 0 732 |
| 25          |   | 0 564 | 0 780   | 0 915 | 0 813 | 0 79 | 0 848 |
| 26          |   | 567   | 0 01088 | 147   | 0 044 | 0 0  | 79    |
| 27          |   | 0 57  | 1 01 88 | 1 147 | 1 44  | 1 02 | 0 195 |
| 28          |   | 0 573 | 0 24174 | 0 379 | 0 275 | 0 25 | 0 310 |
| 29          |   | 0 575 | 1 24174 | 1 379 | 1 75  | 1 5  | 0 426 |

I L p Y d m i h t h d t i O l m by d y ft F b 8

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

**X continued**      **Motions of Mean Longitude and the Arguments for Days**

| 1                |           | 2          | 3       | 4     | 5     | 6     | 7     | 8      |
|------------------|-----------|------------|---------|-------|-------|-------|-------|--------|
| Day              |           | Mean Long. | A       | B     | C     | D     | E     | F—I    |
|                  |           | °          | d       | d     | d     | d     | d     | d      |
| <b>July</b>      | <b>30</b> | 96°17740   | 2°99765 | 1°822 | 0°309 | 0°465 | 0°471 | 211°00 |
|                  | <b>31</b> | 299°66640  | 0°47219 | 0°472 | 1°309 | 1°465 | 1°471 | 212°00 |
| <b>August</b>    | <b>1</b>  | 143°15539  | 1°47219 | 1°472 | 0°539 | 0°696 | 0°702 | 213°00 |
|                  | <b>2</b>  | 346°64438  | 2°47219 | 0°122 | 1°539 | 1°696 | 1°702 | 214°00 |
|                  | <b>3</b>  | 190°13337  | 3°47219 | 1°122 | 0°768 | 0°927 | 0°932 | 215°00 |
|                  | <b>4</b>  | 33°62237   | 0°94672 | 2°122 | 1°768 | 0°158 | 0°163 | 216°00 |
|                  | <b>5</b>  | 237°11136  | 1°94672 | 0°772 | 0°998 | 1°158 | 1°163 | 217°00 |
|                  | <b>6</b>  | 80°60035   | 2°94672 | 1°772 | 0°227 | 0°389 | 0°394 | 218°00 |
|                  | <b>7</b>  | 284°08934  | 0°42126 | 0°421 | 1°227 | 1°389 | 1°394 | 219°00 |
|                  | <b>8</b>  | 127°57834  | 1°42126 | 1°421 | 0°457 | 0°619 | 0°625 | 220°00 |
|                  | <b>9</b>  | 331°06733  | 2°42126 | 0°071 | 1°457 | 1°619 | 1°625 | 221°00 |
|                  | <b>10</b> | 174°55632  | 3°42126 | 1°071 | 0°686 | 0°850 | 0°856 | 222°00 |
|                  | <b>11</b> | 18°04531   | 0°89580 | 2°071 | 1°686 | 0°081 | 0°087 | 223°00 |
|                  | <b>12</b> | 221°53431  | 1°89580 | 0°721 | 0°915 | 1°081 | 1°087 | 224°00 |
|                  | <b>13</b> | 65°02330   | 2°89580 | 1°721 | 0°145 | 0°312 | 0°317 | 225°00 |
|                  | <b>14</b> | 268°51229  | 0°37033 | 0°370 | 1°145 | 1°312 | 1°317 | 226°00 |
|                  | <b>15</b> | 112°00128  | 1°37033 | 1°370 | 0°374 | 0°543 | 0°548 | 227°00 |
|                  | <b>16</b> | 315°49028  | 2°37033 | 0°020 | 1°374 | 1°543 | 1°548 | 228°00 |
|                  | <b>17</b> | 158°97927  | 3°37033 | 1°020 | 0°604 | 0°773 | 0°779 | 229°00 |
|                  | <b>18</b> | 2°46826    | 0°84487 | 2°020 | 1°604 | 0°004 | 0°010 | 230°00 |
|                  | <b>19</b> | 205°95725  | 1°84487 | 0°670 | 0°833 | 1°004 | 1°010 | 231°00 |
|                  | <b>20</b> | 49°44624   | 2°84487 | 1°670 | 0°063 | 0°235 | 0°241 | 232°00 |
|                  | <b>21</b> | 252°93524  | 0°31941 | 0°319 | 1°063 | 1°235 | 1°241 | 233°00 |
|                  | <b>22</b> | 96°42423   | 1°31941 | 1°319 | 0°292 | 0°466 | 0°472 | 234°00 |
|                  | <b>23</b> | 299°91322  | 2°31941 | 2°319 | 1°292 | 1°466 | 1°472 | 235°00 |
|                  | <b>24</b> | 143°40221  | 3°31941 | 0°969 | 0°522 | 0°697 | 0°703 | 236°00 |
|                  | <b>25</b> | 346°89121  | 0°79394 | 1°969 | 1°522 | 1°697 | 1°703 | 237°00 |
|                  | <b>26</b> | 190°38020  | 1°79394 | 0°619 | 0°751 | 0°927 | 0°933 | 238°00 |
|                  | <b>27</b> | 33°86919   | 2°79394 | 1°619 | 1°751 | 0°158 | 0°164 | 239°00 |
|                  | <b>28</b> | 237°35818  | 0°26848 | 0°268 | 0°981 | 1°158 | 1°164 | 240°00 |
|                  | <b>29</b> | 80°84718   | 1°26848 | 1°268 | 0°210 | 0°389 | 0°395 | 241°00 |
|                  | <b>30</b> | 284°33617  | 2°26848 | 2°268 | 1°210 | 1°389 | 1°395 | 242°00 |
|                  | <b>31</b> | 127°82516  | 3°26848 | 0°918 | 0°440 | 0°620 | 0°626 | 243°00 |
| <b>September</b> | <b>1</b>  | 331°31415  | 0°74301 | 1°918 | 1°440 | 1°620 | 1°626 | 244°00 |
|                  | <b>2</b>  | 174°80315  | 1°74301 | 0°568 | 0°669 | 0°851 | 0°857 | 245°00 |
|                  | <b>3</b>  | 18°29214   | 2°74301 | 1°568 | 1°669 | 0°081 | 0°088 | 246°00 |
|                  | <b>4</b>  | 221°78113  | 0°21755 | 0°218 | 0°899 | 1°081 | 1°088 | 247°00 |
|                  | <b>5</b>  | 65°27012   | 1°21755 | 1°218 | 0°128 | 0°312 | 0°318 | 248°00 |
|                  | <b>6</b>  | 268°75912  | 2°21755 | 2°218 | 1°128 | 1°312 | 1°318 | 249°00 |
|                  | <b>7</b>  | 112°24811  | 3°21755 | 0°867 | 0°358 | 0°543 | 0°549 | 250°00 |
|                  | <b>8</b>  | 315°73710  | 0°69209 | 1°867 | 1°358 | 1°543 | 1°549 | 251°00 |
|                  | <b>9</b>  | 159°22609  | 1°69209 | 0°517 | 0°587 | 0°774 | 0°780 | 252°00 |
|                  | <b>10</b> | 2°71509    | 2°69209 | 1°517 | 1°587 | 0°005 | 0°011 | 253°00 |
|                  | <b>11</b> | 206°20408  | 0°16662 | 0°167 | 0°817 | 1°005 | 1°011 | 254°00 |
|                  | <b>12</b> | 49°69307   | 1°16662 | 1°167 | 0°046 | 0°236 | 0°242 | 255°00 |
|                  | <b>13</b> | 253°18206  | 2°16662 | 2°167 | 1°046 | 1°236 | 1°242 | 256°00 |
|                  | <b>14</b> | 96°67106   | 3°16662 | 0°816 | 0°276 | 0°466 | 0°473 | 257°00 |
|                  | <b>15</b> | 300°16005  | 0°64116 | 1°816 | 1°276 | 1°466 | 1°473 | 258°00 |
|                  | <b>16</b> | 143°64904  | 1°64116 | 0°466 | 0°505 | 0°697 | 0°704 | 259°00 |
|                  | <b>17</b> | 347°13803  | 2°64116 | 1°466 | 1°505 | 1°697 | 1°704 | 260°00 |
|                  | <b>18</b> | 190°62703  | 0°11570 | 0°116 | 0°735 | 0°928 | 0°934 | 261°00 |
|                  | <b>19</b> | 34°11602   | 1°11570 | 1°116 | 1°735 | 0°159 | 0°165 | 262°00 |

In Leap Year diminish the date in Columns 1, 9, by 1 day after Feb. 28.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 9         |    |       |              |       | 3          | 4    | 5     | 6    |
|-----------|----|-------|--------------|-------|------------|------|-------|------|
| Day       |    | J     | K            | L     | M          | N, O | P     | Q    |
| July      | 30 | 0 578 | d<br>0 47 60 | 0 611 | d<br>0 506 | 0 48 | 0 54  | 49   |
|           | 31 | 0 581 | 1 4726       | 1 611 | 1 506      | 1 48 | 0 658 | 60   |
| August    | 1  | 584   | 0 70346      | 0 843 | 738        | 0 71 | 0 773 | 0 72 |
|           | 2  | 586   | 1 7 346      | 0 75  | 1 738      | 1 71 | 0 0 5 | 0 84 |
|           | 3  | 0 589 | 0 93433      | 1 075 | 0 969      | 0 94 | 1 1   | 0 07 |
|           | 4  | 59    | 0 16519      | 0 307 |            | 0 17 | 36    | 0 18 |
|           | 5  | 595   | 1 16519      | 1 3 7 | 1 0        | 1 17 | 0 35  | 3    |
|           | 6  | 0 597 | 39605        | 0 539 | 0 431      | 0 4  | 0 468 | 41   |
|           | 7  | 0 600 | 1 396 5      | 1 539 | 1 431      | 1 40 | 0 583 | 53   |
|           | 8  | 0 603 | 62691        | 0 771 | 0 662      | 0 63 | 0 699 | 0 64 |
|           | 9  | 0 605 | 1 6 691      | 0 003 | 1 662      | 1 63 | 0 815 | 0 76 |
|           | 10 | 608   | 0 85777      | 1 003 | 0 893      | 0 87 | 0 046 | 0 00 |
|           | 11 | 0 611 | 8864         | 0 35  | 0 1 4      | 0 10 | 0 162 | 0 11 |
|           | 12 | 0 614 | 1 8864       | 1 35  | 1 1 4      | 1 10 | 0 78  | 0    |
|           | 13 | 0 616 | 0 3195       | 0 467 | 0 356      | 0 33 | 0 393 | 0 34 |
|           | 14 | 0 619 | 1 31950      | 1 467 | 1 356      | 1 33 | 0 509 | 0 45 |
|           | 15 | 0 6   | 0 55036      | 0 699 | 0 587      | 0 56 | 0 625 | 0 57 |
|           | 16 | 625   | 1 55 36      | 1 699 | 1 587      | 1 56 | 0 741 | 68   |
|           | 17 | 0 627 | 781          | 0 931 | 0 818      | 0 79 | 0 856 | 0 80 |
|           | 18 | 0 630 | 0 01 09      | 0 164 | 0 49       | 0 02 | 0 088 | 0 03 |
|           | 19 | 0 633 | 1 01 9       | 1 164 | 1 049      | 1 02 | 0 204 | 0 15 |
|           | 20 | 0 636 | 0 4 95       | 0 396 | 0 280      | 0 25 | 0 319 | 0 26 |
|           | 21 | 0 638 | 1 24 95      | 1 396 | 1 8        | 1 5  | 435   | 0 38 |
|           | 22 | 641   | 0 47381      | 6 8   | 0 511      | 0 48 | 551   | 0 49 |
|           | 23 | 0 644 | 1 47381      | 1 6 8 | 1 511      | 1 48 | 666   | 61   |
|           | 24 | 647   | 0 70467      | 0 860 | 743        | 71   | 0 78  | 0 72 |
|           | 25 | 0 649 | 1 70467      | 0 92  | 1 743      | 1 71 | 0 014 | 84   |
|           | 26 | 65    | 0 93553      | 1 9   | 0 974      | 0 94 | 0 129 | 0 07 |
|           | 27 | 655   | 0 16640      | 0 3 4 | 0 05       | 0 17 | 0 45  | 0 19 |
|           | 28 | 0 658 | 1 1664       | 1 3 4 | 1 05       | 1 17 | 0 361 | 0 30 |
|           | 29 | 0 660 | 0 39726      | 0 556 | 0 436      | 0 41 | 0 476 | 0 42 |
|           | 30 | 663   | 1 39726      | 1 556 | 1 436      | 1 41 | 0 592 | 0 53 |
|           | 31 | 0 666 | 0 6 812      | 0 788 | 0 667      | 0 64 | 0 708 | 0 65 |
| September | 1  | 0 668 | 1 6 812      | 0 02  | 1 667      | 1 64 | 824   | 0 76 |
|           | 2  | 0 671 | 0 85898      | 1 02  | 0 898      | 0 87 | 0 055 | 0 00 |
|           | 3  | 0 674 | 0 08985      | 0 5   | 0 1 9      | 0 1  | 0 171 | 0 11 |
|           | 4  | 677   | 1 8985       | 1 5   | 1 129      | 1 10 | 0 87  | 3    |
|           | 5  | 679   | 3 071        | 0 484 | 0 361      | 0 33 | 0 40  | 0 34 |
|           | 6  | 0 68  | 1 3 071      | 1 484 | 1 361      | 1 33 | 0 518 | 0 46 |
|           | 7  | 0 685 | 55157        | 716   | 0 59       | 0 56 | 0 634 | 0 57 |
|           | 8  | 688   | 1 55157      | 1 716 | 1 59       | 1 56 | 0 749 | 0 69 |
|           | 9  | 69    | 0 78 43      | 0 948 | 0 8 3      | 0 79 | 0 865 | 0 80 |
|           | 10 | 0 693 | 0 1329       | 0 180 | 0 54       | 0 0  | 0 097 | 0 3  |
|           | 11 | 0 696 | 1 013 9      | 1 180 | 1 054      | 1 0  | 0 21  | 0 15 |
|           | 12 | 0 699 | 24416        | 0 41  | 0 85       | 0 5  | 0 328 | 0 26 |
|           | 13 | 7 1   | 1 4416       | 1 41  | 1 285      | 1 25 | 0 444 | 0 38 |
|           | 14 | 0 704 | 0 4750       | 644   | 0 516      | 0 48 | 0 559 | 0 50 |
|           | 15 | 0 707 | 1 475        | 1 644 | 1 516      | 1 48 | 0 675 | 0 61 |
|           | 16 | 0 710 | 0 70588      | 0 876 | 0 747      | 0 71 | 0 791 | 73   |
|           | 17 | 712   | 1 70588      | 0 1 8 | 1 747      | 1 71 | 0 0   | 0 84 |
|           | 18 | 0 715 | 0 93674      | 1 108 | 0 979      | 0 95 | 0 138 | 0 07 |
|           | 19 | 0 718 | 0 16761      | 340   | 0 210      | 0 18 | 0 54  | 0 19 |

I L p Y dimi h th d t C lum g by d y ft F b 8

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 1                   | 2          | 3       | 4     | 5     | 6     | 7     | 8      |
|---------------------|------------|---------|-------|-------|-------|-------|--------|
| Day                 | Mean Long. | A       | B     | C     | D     | E     | F—I    |
|                     | °          | d       | d     | d     | d     | d     | d      |
| <b>September</b> 20 | 237°60501  | 2°11570 | 2°116 | 0°964 | 1°159 | 1°165 | 263°00 |
| 21                  | 81°09400   | 3°11570 | 0°765 | 0°194 | 0°390 | 0°396 | 264°00 |
| 22                  | 284°58300  | 0°59023 | 1°765 | 1°194 | 1°390 | 1°396 | 265°00 |
| 23                  | 128°07199  | 1°59023 | 0°415 | 0°423 | 0°620 | 0°627 | 266°00 |
| 24                  | 331°56098  | 2°59023 | 1°415 | 1°423 | 1°620 | 1°627 | 267°00 |
| 25                  | 175°04997  | 0°06477 | 0°065 | 0°653 | 0°851 | 0°858 | 268°00 |
| 26                  | 18°53897   | 1°06477 | 1°065 | 1°653 | 0°082 | 0°089 | 269°00 |
| 27                  | 222°02796  | 2°06477 | 2°065 | 0°882 | 1°082 | 1°089 | 270°00 |
| 28                  | 65°51695   | 3°06477 | 0°714 | 0°112 | 0°313 | 0°319 | 271°00 |
| 29                  | 269°00594  | 0°53931 | 1°714 | 1°112 | 1°313 | 1°319 | 272°00 |
| <b>October</b> 30   | 112°49493  | 1°53931 | 0°364 | 0°341 | 0°544 | 0°550 | 273°00 |
| 1                   | 315°98393  | 2°53931 | 1°364 | 1°341 | 1°544 | 1°550 | 274°00 |
| 2                   | 159°47292  | 0°01384 | 0°014 | 0°571 | 0°774 | 0°781 | 275°00 |
| 3                   | 2°96191    | 1°01384 | 1°014 | 1°571 | 0°005 | 0°012 | 276°00 |
| 4                   | 206°45090  | 2°01384 | 2°014 | 0°800 | 1°005 | 1°012 | 277°00 |
| 5                   | 49°93990   | 3°01384 | 0°664 | 0°030 | 0°236 | 0°243 | 278°00 |
| 6                   | 253°42889  | 0°48838 | 1°664 | 1°030 | 1°236 | 1°243 | 279°00 |
| 7                   | 96°91788   | 1°48838 | 0°313 | 0°259 | 0°467 | 0°474 | 280°00 |
| 8                   | 300°40687  | 2°48838 | 1°313 | 1°259 | 1°467 | 1°474 | 281°00 |
| 9                   | 143°89587  | 3°48838 | 2°313 | 0°489 | 0°698 | 0°705 | 282°00 |
| 10                  | 347°38486  | 0°96291 | 0°963 | 1°489 | 1°698 | 1°705 | 283°00 |
| 11                  | 190°87385  | 1°96291 | 1°963 | 0°718 | 0°928 | 0°935 | 284°00 |
| 12                  | 34°36284   | 2°96291 | 0°613 | 1°718 | 0°159 | 0°166 | 285°00 |
| 13                  | 237°85184  | 0°43745 | 1°613 | 0°948 | 1°159 | 1°166 | 286°00 |
| 14                  | 81°34083   | 1°43745 | 0°262 | 0°177 | 0°390 | 0°397 | 287°00 |
| 15                  | 284°82982  | 2°43745 | 1°262 | 1°177 | 1°390 | 1°397 | 288°00 |
| 16                  | 128°31881  | 3°43745 | 2°262 | 0°407 | 0°621 | 0°628 | 289°00 |
| 17                  | 331°80781  | 0°91199 | 0°912 | 1°407 | 1°621 | 1°628 | 290°00 |
| 18                  | 175°29680  | 1°91199 | 1°912 | 0°636 | 0°852 | 0°859 | 291°00 |
| 19                  | 18°78579   | 2°91199 | 0°562 | 1°636 | 0°082 | 0°090 | 292°00 |
| 20                  | 222°27478  | 0°38652 | 1°562 | 0°866 | 1°082 | 1°090 | 293°00 |
| 21                  | 65°76378   | 1°38652 | 0°211 | 0°095 | 0°313 | 0°320 | 294°00 |
| 22                  | 269°25277  | 2°38652 | 1°211 | 1°095 | 1°313 | 1°320 | 295°00 |
| 23                  | 112°74176  | 3°38652 | 2°211 | 0°324 | 0°544 | 0°551 | 296°00 |
| 24                  | 316°23075  | 0°86106 | 0°861 | 1°324 | 1°544 | 1°551 | 297°00 |
| 25                  | 159°71975  | 1°86106 | 1°861 | 0°554 | 0°775 | 0°782 | 298°00 |
| 26                  | 3°20874    | 2°86106 | 0°511 | 1°554 | 0°006 | 0°013 | 299°00 |
| 27                  | 206°69773  | 0°33560 | 1°511 | 0°783 | 1°006 | 1°013 | 300°00 |
| 28                  | 50°18672   | 1°33560 | 0°160 | 0°013 | 0°236 | 0°244 | 301°00 |
| 29                  | 253°67572  | 2°33560 | 1°160 | 1°013 | 1°236 | 1°244 | 302°00 |
| 30                  | 97°16471   | 3°33560 | 2°160 | 0°242 | 0°467 | 0°475 | 303°00 |
| <b>November</b> 31  | 300°65370  | 0°81013 | 0°810 | 1°242 | 1°467 | 1°475 | 304°00 |
| 1                   | 144°14269  | 1°81013 | 1°810 | 0°472 | 0°698 | 0°706 | 305°00 |
| 2                   | 347°63169  | 2°81013 | 0°460 | 1°472 | 1°698 | 1°706 | 306°00 |
| 3                   | 191°12068  | 0°28467 | 1°460 | 0°701 | 0°929 | 0°936 | 307°00 |
| 4                   | 34°60967   | 1°28467 | 0°110 | 1°701 | 0°160 | 0°167 | 308°00 |
| 5                   | 238°09866  | 2°28467 | 1°110 | 0°931 | 1°160 | 1°167 | 309°00 |
| 6                   | 81°58765   | 3°28467 | 2°110 | 0°160 | 0°390 | 0°398 | 310°00 |
| 7                   | 285°07665  | 0°75921 | 0°759 | 1°160 | 1°390 | 1°398 | 311°00 |
| 8                   | 128°56564  | 1°75921 | 1°759 | 0°390 | 0°621 | 0°629 | 312°00 |
| 9                   | 332°05463  | 2°75921 | 0°409 | 1°390 | 1°621 | 1°629 | 313°00 |
| 10                  | 175°54362  | 0°23374 | 1°409 | 0°619 | 0°852 | 0°860 | 314°00 |

In Leap Year diminish the date in Columns 1, 2, by 1 day after Feb. 28.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 9                |       |         |       | 3     | 4    | 5     | 6    |
|------------------|-------|---------|-------|-------|------|-------|------|
| Day              | J     | K       | L     | M     | N, O | P     | Q    |
|                  |       |         | d     |       | d    | d     | l    |
| <b>September</b> |       |         |       |       |      |       |      |
| 20               | 0 721 | 1 16761 | 1 340 | 1 1   | 1 18 | 0 370 | 0 30 |
| 21               | 0 723 | 0 39847 | 0 57  | 0 441 | 41   | 0 485 | 0 42 |
| 22               | 0 7 6 | 1 39847 | 1 572 | 1 441 | 1 41 | 0 601 | 0 54 |
| 23               | 0 729 | 0 6 933 | 0 804 | 0 672 | 0 64 | 0 717 | 0 65 |
| 24               | 0 73  | 1 6 933 | 0 36  | 1 672 | 1 64 | 0 83  | 0 77 |
| 25               | 0 734 | 0 86019 | 1 036 | 903   | 0 87 | 0 064 | 0    |
| 26               | 0 737 | 0 09105 | 0 268 | 134   | 0 10 | 0 180 | 11   |
| 27               | 0 740 | 1 09105 | 1 68  | 1 134 | 1 10 | 0 95  | 0 23 |
| 28               | 0 742 | 3219    | 0 500 | 0 365 | 0 33 | 411   | 0 34 |
| 29               | 0 745 | 1 3219  | 1 500 | 1 365 | 1 33 | 0 527 | 0 46 |
| <b>October</b>   |       |         |       |       |      |       |      |
| 30               | 0 748 | 0 55278 | 0 73  | 0 597 | 0 56 | 0 64  | 0 57 |
| 1                | 0 751 | 1 55278 | 1 732 | 1 597 | 1 56 | 0 758 | 0 69 |
| 2                | 0 753 | 0 78364 | 0 964 | 828   | 0 79 | 0 874 | 0 81 |
| 3                | 0 756 | 0 1450  | 0 196 | 0 59  | 0    | 0 105 | 0 04 |
| 4                | 0 759 | 1 1450  | 1 196 | 1 059 | 1 02 | 0 21  | 0 15 |
| 5                | 0 762 | 0 24537 | 0 428 | 0 90  | 0 25 | 0 337 | 0 27 |
| 6                | 0 764 | 1 4537  | 1 4 8 | 1 290 | 1 5  | 0 453 | 0 38 |
| 7                | 0 767 | 0 476 3 | 0 660 | 0 521 | 0 49 | 0 568 | 0 50 |
| 8                | 0 770 | 1 47623 | 1 660 | 1 5 1 | 1 49 | 0 684 | 0 61 |
| 9                | 0 773 | 0 70709 | 0 892 | 0 752 | 0 72 | 0 80  | 0 73 |
| 10               | 0 775 | 1 70709 | 0 124 | 1 75  | 1 72 | 0 031 | 0 85 |
| 11               | 0 778 | 0 93795 | 1 124 | 0 983 | 0 95 | 0 147 | 0 08 |
| 12               | 0 781 | 0 16881 | 356   | 0 215 | 0 18 | 0 263 | 0 19 |
| 13               | 0 784 | 1 16881 | 1 356 | 1 15  | 1 18 | 0 378 | 0 31 |
| 14               | 0 786 | 0 39968 | 0 588 | 0 446 | 0 41 | 0 494 | 0 42 |
| 15               | 0 789 | 1 39968 | 1 588 | 1 446 | 1 41 | 0 610 | 0 54 |
| 16               | 0 792 | 0 63054 | 0 8 0 | 0 677 | 0 64 | 0 726 | 0 65 |
| 17               | 0 795 | 1 63054 | 0 052 | 1 677 | 1 64 | 0 841 | 0 77 |
| 18               | 0 797 | 0 86140 | 1 052 | 0 9 8 | 0 87 | 0 73  | 0 00 |
| 19               | 80    | 0 09 26 | 0 284 | 0 139 | 0 10 | 0 188 | 0 12 |
| 20               | 0 803 | 1 09226 | 1 284 | 1 139 | 1 10 | 0 304 | 0 23 |
| 21               | 0 805 | 0 3 313 | 0 516 | 0 370 | 0 33 | 0 420 | 0 35 |
| 22               | 0 808 | 1 3 313 | 1 516 | 1 370 | 1 33 | 0 536 | 0 46 |
| 23               | 811   | 0 55399 | 0 749 | 0 6 2 | 0 56 | 651   | 0 58 |
| 24               | 814   | 1 55399 | 1 749 | 1 60  | 1 56 | 0 767 | 0 69 |
| 25               | 0 816 | 78485   | 0 981 | 0 833 | 0 80 | 0 883 | 0 81 |
| 26               | 0 819 | 0 1571  | 0 213 | 0 064 | 0 03 | 0 114 | 0 4  |
| 27               | 0 8   | 1 1571  | 1 13  | 1 064 | 1 03 | 0 230 | 0 16 |
| 28               | 8 5   | 0 24657 | 0 445 | 0 95  | 0 26 | 0 346 | 0 27 |
| 29               | 8 7   | 1 24657 | 1 445 | 1 95  | 1 6  | 0 461 | 0 39 |
| 30               | 0 830 | 0 47744 | 677   | 0 526 | 0 49 | 0 577 | 0 50 |
| 31               | 0 833 | 1 47744 | 1 677 | 1 526 | 1 49 | 0 693 | 0 62 |
| <b>November</b>  |       |         |       |       |      |       |      |
| 1                | 0 836 | 70830   | 0 909 | 0 757 | 0 7  | 809   | 73   |
| 2                | 0 838 | 1 7 830 | 0 141 | 1 757 | 1 7  | 0 040 | 0 85 |
| 3                | 0 841 | 0 93916 | 1 141 | 0 988 | 0 95 | 0 156 | 0 08 |
| 4                | 0 844 | 0 17002 | 0 373 | 2 0   | 0 18 | 0 271 | 0 19 |
| 5                | 0 847 | 1 17002 | 1 373 | 1 20  | 1 18 | 0 387 | 0 31 |
| 6                | 0 849 | 0 40 88 | 0 605 | 0 451 | 0 41 | 0 503 | 43   |
| 7                | 852   | 1 4 088 | 1 605 | 1 451 | 1 41 | 0 619 | 0 54 |
| 8                | 855   | 0 63175 | 0 837 | 0 68  | 0 64 | 0 734 | 0 66 |
| 9                | 0 858 | 1 63175 | 0 069 | 1 68  | 1 64 | 0 850 | 0 77 |
| 10               | 0 860 | 0 86261 | 1 069 | 0 913 | 0 87 | 0 081 | 0 00 |



# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

**X continued**      Motions of Mean Longitude and the Arguments for Days

| 1                  | 2          | 3       | 4     | 5     | 6     | 7     | 8      |
|--------------------|------------|---------|-------|-------|-------|-------|--------|
| Day                | Mean Long. | A       | B     | C     | D     | E     | F—I    |
|                    | °          | d       | d     | d     | d     | d     | d      |
| <b>November 11</b> | 19°03262   | 1°23374 | 0°059 | 1°619 | 0°083 | 0°091 | 315°00 |
| <b>12</b>          | 222°52161  | 2°23374 | 1°059 | 0°849 | 1°083 | 1°091 | 316°00 |
| <b>13</b>          | 66°01060   | 3°23374 | 2°059 | 0°078 | 0°314 | 0°321 | 317°00 |
| <b>14</b>          | 269°49959  | 0°70828 | 0°708 | 1°078 | 1°314 | 1°321 | 318°00 |
| <b>15</b>          | 112°98859  | 1°70828 | 1°708 | 0°308 | 0°544 | 0°552 | 319°00 |
| <b>16</b>          | 316°47758  | 2°70828 | 0°358 | 1°308 | 1°544 | 1°552 | 320°00 |
| <b>17</b>          | 159°96657  | 0°18282 | 1°358 | 0°537 | 0°775 | 0°782 | 321°00 |
| <b>18</b>          | 3°45556    | 1°18282 | 0°008 | 1°537 | 0°006 | 0°014 | 322°00 |
| <b>19</b>          | 206°94456  | 2°18282 | 1°008 | 0°767 | 1°006 | 1°014 | 323°00 |
| <b>20</b>          | 50°43355   | 3°18282 | 2°008 | 1°767 | 0°237 | 0°245 | 324°00 |
| <b>21</b>          | 253°92254  | 0°65735 | 0°657 | 0°996 | 1°237 | 1°245 | 325°00 |
| <b>22</b>          | 97°41153   | 1°65735 | 1°657 | 0°226 | 0°468 | 0°476 | 326°00 |
| <b>23</b>          | 300°90053  | 2°65735 | 0°307 | 1°226 | 1°468 | 1°476 | 327°00 |
| <b>24</b>          | 144°38952  | 0°13189 | 1°307 | 0°455 | 0°698 | 0°707 | 328°00 |
| <b>25</b>          | 347°87851  | 1°13189 | 2°307 | 1°455 | 1°698 | 1°707 | 329°00 |
| <b>26</b>          | 191°36750  | 2°13189 | 0°957 | 0°685 | 0°929 | 0°937 | 330°00 |
| <b>27</b>          | 34°85650   | 3°13189 | 1°957 | 1°685 | 0°160 | 0°168 | 331°00 |
| <b>28</b>          | 238°34549  | 0°60642 | 0°606 | 0°914 | 1°160 | 1°168 | 332°00 |
| <b>29</b>          | 81°83448   | 1°60642 | 1°606 | 0°144 | 0°391 | 0°398 | 333°00 |
| <b>30</b>          | 285°32347  | 2°60642 | 0°256 | 1°144 | 1°391 | 1°398 | 334°00 |
| <b>December 1</b>  | 128°81247  | 0°08096 | 1°256 | 0°373 | 0°622 | 0°630 | 335°00 |
| <b>2</b>           | 332°30146  | 1°08096 | 2°256 | 1°373 | 1°622 | 1°630 | 336°00 |
| <b>3</b>           | 175°79045  | 2°08096 | 0°906 | 0°603 | 0°852 | 0°861 | 337°00 |
| <b>4</b>           | 19°27944   | 3°08096 | 1°906 | 1°603 | 0°083 | 0°092 | 338°00 |
| <b>5</b>           | 222°76844  | 0°55550 | 0°556 | 0°832 | 1°083 | 1°092 | 339°00 |
| <b>6</b>           | 66°25743   | 1°55550 | 1°556 | 0°062 | 0°314 | 0°322 | 340°00 |
| <b>7</b>           | 269°74642  | 2°55550 | 0°205 | 1°062 | 1°314 | 1°322 | 341°00 |
| <b>8</b>           | 113°23541  | 0°03003 | 1°205 | 0°291 | 0°545 | 0°553 | 342°00 |
| <b>9</b>           | 316°72441  | 1°03003 | 2°205 | 1°291 | 1°545 | 1°553 | 343°00 |
| <b>10</b>          | 160°21340  | 2°03003 | 0°855 | 0°521 | 0°776 | 0°784 | 344°00 |
| <b>11</b>          | 3°70239    | 3°03003 | 1°855 | 1°521 | 0°006 | 0°015 | 345°00 |
| <b>12</b>          | 207°19138  | 0°50457 | 0°505 | 0°750 | 1°006 | 1°015 | 346°00 |
| <b>13</b>          | 50°68037   | 1°50457 | 1°505 | 1°750 | 0°237 | 0°246 | 347°00 |
| <b>14</b>          | 254°16937  | 2°50457 | 0°154 | 0°980 | 1°237 | 1°246 | 348°00 |
| <b>15</b>          | 97°65836   | 3°50457 | 1°154 | 0°209 | 0°468 | 0°477 | 349°00 |
| <b>16</b>          | 301°14735  | 0°97911 | 2°154 | 1°209 | 1°468 | 1°477 | 350°00 |
| <b>17</b>          | 144°63634  | 1°97911 | 0°804 | 0°439 | 0°699 | 0°708 | 351°00 |
| <b>18</b>          | 348°12534  | 2°97911 | 1°804 | 1°439 | 1°699 | 1°708 | 352°00 |
| <b>19</b>          | 191°61433  | 0°45364 | 0°454 | 0°668 | 0°930 | 0°938 | 353°00 |
| <b>20</b>          | 35°10332   | 1°45364 | 1°454 | 1°668 | 0°160 | 0°169 | 354°00 |
| <b>21</b>          | 238°59231  | 2°45364 | 0°103 | 0°898 | 1°160 | 1°169 | 355°00 |
| <b>22</b>          | 82°08131   | 3°45364 | 1°103 | 0°127 | 0°391 | 0°400 | 356°00 |
| <b>23</b>          | 285°57030  | 0°92818 | 2°103 | 1°127 | 1°391 | 1°400 | 357°00 |
| <b>24</b>          | 129°05929  | 1°92818 | 0°753 | 0°357 | 0°622 | 0°631 | 358°00 |
| <b>25</b>          | 332°54828  | 2°92818 | 1°753 | 1°357 | 1°622 | 1°631 | 359°00 |
| <b>26</b>          | 176°03728  | 0°40272 | 0°403 | 0°586 | 0°853 | 0°862 | 360°00 |
| <b>27</b>          | 19°52627   | 1°40272 | 1°403 | 1°586 | 0°084 | 0°093 | 361°00 |
| <b>28</b>          | 223°01526  | 2°40272 | 0°052 | 0°816 | 1°084 | 1°093 | 362°00 |
| <b>29</b>          | 66°50425   | 3°40272 | 1°052 | 0°045 | 0°314 | 0°323 | 363°00 |
| <b>30</b>          | 269°99325  | 0°87725 | 2°052 | 1°045 | 1°314 | 1°323 | 364°00 |
| <b>31</b>          | 113°48224  | 1°87725 | 0°702 | 0°275 | 0°545 | 0°554 | 365°00 |
| <b>32</b>          | 316°97123  | 2°87725 | 1°702 | 1°275 | 1°545 | 1°554 | 366°00 |

In Leap Year diminish the date in Columns 1, 9, by 1 day after Feb. 28.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

X continued Motions of Mean Longitude and the Arguments for Days

| 9                  |       |         |       | 3     | 4    | 5     | 6    |
|--------------------|-------|---------|-------|-------|------|-------|------|
| Day                | J     | K       | L     | M     | N O  | P     | Q    |
|                    | y     | l       |       |       |      | a     |      |
| <b>November 11</b> | 0 863 | 09347   | 0 301 | 0 144 | 0 10 | 0 197 | 0 1  |
| <b>12</b>          | 0 866 | 1 09347 | 1 301 | 1 144 | 1 10 | 0 313 | 0 23 |
| <b>13</b>          | 868   | 0 3 433 | 0 533 | 375   | 34   | 0 4 9 | 0 35 |
| <b>14</b>          | 0 871 | 1 3 433 | 1 533 | 1 375 | 1 34 | 0 544 | 0 47 |
| <b>15</b>          | 0 874 | 0 555 0 | 0 765 | 0 6 6 | 57   | 0 660 | 0 58 |
| <b>16</b>          | 0 877 | 1 555 0 | 1 765 | 1 606 | 1 57 | 0 776 | 0 70 |
| <b>17</b>          | 879   | 0 78606 | 0 997 | 0 838 | 0 80 | 0 7   | 0 81 |
| <b>18</b>          | 882   | 0 01692 | 0 9   | 069   | 0 03 | 1 3   | 0 4  |
| <b>19</b>          | 0 885 | 1 0169  | 1 9   | 1 069 | 1 3  | 0 39  | 16   |
| <b>20</b>          | 0 888 | 4778    | 461   | 0 300 | 0 6  | 0 354 | 0 7  |
| <b>21</b>          | 0 890 | 1 4778  | 1 461 | 1 300 | 1 6  | 0 470 | 0 39 |
| <b>22</b>          | 0 893 | 0 47864 | 0 693 | 0 531 | 0 49 | 0 586 | 0 50 |
| <b>23</b>          | 0 896 | 47864   | 1 693 | 1 531 | 1 49 | 0 702 | 0 62 |
| <b>24</b>          | 899   | 0 70951 | 0 9 5 | 0 762 | 0 7  | 0 817 | 0 74 |
| <b>25</b>          | 9 1   | 1 70951 | 0 157 | 1 76  | 1 72 | 0 049 | 85   |
| <b>26</b>          | 0 904 | 0 94037 | 1 157 | 0 993 | 0 95 | 0 164 | 0 08 |
| <b>27</b>          | 0 907 | 171 3   | 389   | 224   | 0 18 | 0 280 | 0 2  |
| <b>28</b>          | 0 910 | 1 171 3 | 1 389 | 1 2 4 | 1 18 | 396   | 0 31 |
| <b>29</b>          | 0 91  | 0 4 2 9 | 0 6 1 | 0 456 | 0 41 | 0 51  | 0 43 |
| <b>30</b>          | 0 915 | 1 40209 | 1 621 | 1 456 | 1 41 | 0 627 | 54   |
| <b>December 1</b>  | 0 918 | 63296   | 0 853 | 0 687 | 0 64 | 0 743 | 66   |
| <b>2</b>           | 0 921 | 1 63 96 | 85    | 1 687 | 1 64 | 0 859 | 0 78 |
| <b>3</b>           | 0 9 3 | 0 8638  | 1 85  | 0 918 | 0 88 | 0 9   | 0 01 |
| <b>4</b>           | 0 9 6 | 0 09468 | 0 317 | 149   | 11   | 6     | 0 13 |
| <b>5</b>           | 9 9   | 9468    | 1 317 | 1 149 | 1 11 | 3 2   | 0 24 |
| <b>6</b>           | 0 93  | 0 3 554 | 0 549 | 0 380 | 0 34 | 0 437 | 0 35 |
| <b>7</b>           | 0 934 | 1 3 554 | 1 549 | 1 38  | 1 34 | 553   | 0 47 |
| <b>8</b>           | 0 937 | 0 55640 | 0 781 | 0 611 | 0 57 | 0 669 | 58   |
| <b>9</b>           | 0 940 | 1 5564  | 0 13  | 1 611 | 1 57 | 785   | 0 70 |
| <b>10</b>          | 0 94  | 0 787 7 | 1 013 | 0 84  | 0 80 | 0 016 | 0 81 |
| <b>11</b>          | 0 945 | 0 01813 | 0 45  | 0 74  | 0 03 | 0 132 | 0 05 |
| <b>12</b>          | 0 948 | 1 1813  | 1 245 | 1 074 | 1 3  | 0 47  | 0 17 |
| <b>13</b>          | 0 951 | 4899    | 477   | 0 305 | 0 26 | 0 363 | 0 28 |
| <b>14</b>          | 953   | 1 4899  | 1 477 | 1 3 5 | 1 6  | 0 479 | 0 39 |
| <b>15</b>          | 956   | 0 47985 | 0 709 | 0 536 | 49   | 0 595 | 0 51 |
| <b>16</b>          | 0 959 | 1 47985 | 1 7 9 | 1 536 | 1 49 | 0 710 | 0 62 |
| <b>17</b>          | 0 96  | 0 7107  | 0 941 | 0 767 | 0 7  | 0 8 6 | 74   |
| <b>18</b>          | 964   | 1 71 72 | 173   | 1 767 | 1 72 | 0 058 | 0 85 |
| <b>19</b>          | 0 967 | 94158   | 1 173 | 998   | 0 95 | 0 173 | 0 09 |
| <b>20</b>          | 0 970 | 0 17244 | 0 4 5 | 0 29  | 0 18 | 89    | 0 0  |
| <b>21</b>          | 0 973 | 1 17 44 | 1 4 5 | 1 9   | 1 18 | 0 405 | 0 32 |
| <b>22</b>          | 0 975 | 0 40330 | 637   | 0 461 | 0 4  | 0 5 0 | 0 43 |
| <b>23</b>          | 978   | 1 40330 | 1 637 | 1 461 | 1 42 | 636   | 0 55 |
| <b>24</b>          | 0 981 | 0 63416 | 0 869 | 0 692 | 0 65 | 0 75  | 0 66 |
| <b>25</b>          | 0 984 | 1 63416 | 0 101 | 1 692 | 1 65 | 0 868 | 0 78 |
| <b>26</b>          | 0 986 | 86503   | 1 101 | 923   | 0 88 | 0 099 | 0 01 |
| <b>27</b>          | 989   | 0 9589  | 0 334 | 0 154 | 0 11 | 15    | 0 12 |
| <b>28</b>          | 0 99  | 1 09589 | 1 334 | 1 154 | 1 11 | 0 330 | 0 24 |
| <b>29</b>          | 0 995 | 0 3 675 | 0 566 | 0 385 | 0 34 | 0 446 | 0 36 |
| <b>30</b>          | 0 997 | 1 3 675 | 1 566 | 1 385 | 1 34 | 0 56  | 47   |
| <b>31</b>          | 1 000 | 0 55762 | 0 798 | 0 616 | 0 57 | 0 678 | 0 59 |
| <b>32</b>          | 1 003 | 1 5576  | 0 030 | 1 616 | 1 57 | 0 793 | 70   |

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XI

Motion of Mean Longitude for Parts of a Day

| 1    | 2          | 1    | 2          | 3      | 4          | 3      | 4          |
|------|------------|------|------------|--------|------------|--------|------------|
| Days | Mean Long. | Days | Mean Long. | Days   | Mean Long. | Days   | Mean Long. |
| d    | °          | d    | °          | d      | °          | d      | °          |
| 0.01 | 2.03489    | 0.51 | 103.77939  | 0.0001 | 0.02035    | 0.0051 | 1.03779    |
| 0.02 | 4.06978    | 0.52 | 105.81428  | 2      | 0.04070    | 52     | 1.05814    |
| 0.03 | 6.10467    | 0.53 | 107.84917  | 3      | 0.06105    | 53     | 1.07849    |
| 0.04 | 8.13956    | 0.54 | 109.88406  | 4      | 0.08140    | 54     | 1.09884    |
| 0.05 | 10.17445   | 0.55 | 111.91895  | 5      | 0.10174    | 55     | 1.11919    |
| 0.06 | 12.20934   | 0.56 | 113.95384  | 0.0006 | 0.12209    | 0.0056 | 1.13954    |
| 0.07 | 14.24423   | 0.57 | 115.98873  | 7      | 0.14244    | 57     | 1.15989    |
| 0.08 | 16.27912   | 0.58 | 118.02362  | 8      | 0.16279    | 58     | 1.18024    |
| 0.09 | 18.31401   | 0.59 | 120.05851  | 9      | 0.18314    | 59     | 1.20059    |
| 0.10 | 20.34890   | 0.60 | 122.09340  | 10     | 0.20349    | 60     | 1.22093    |
| 0.11 | 22.38379   | 0.61 | 124.12829  | 0.0011 | 0.22384    | 0.0061 | 1.24128    |
| 0.12 | 24.41868   | 0.62 | 126.16318  | 12     | 0.24419    | 62     | 1.26163    |
| 0.13 | 26.45357   | 0.63 | 128.19807  | 13     | 0.26454    | 63     | 1.28198    |
| 0.14 | 28.48846   | 0.64 | 130.23296  | 14     | 0.28488    | 64     | 1.30233    |
| 0.15 | 30.52335   | 0.65 | 132.26785  | 15     | 0.30523    | 65     | 1.32268    |
| 0.16 | 32.55824   | 0.66 | 134.30274  | 0.0016 | 0.32558    | 0.0066 | 1.34303    |
| 0.17 | 34.59313   | 0.67 | 136.33762  | 17     | 0.34593    | 67     | 1.36338    |
| 0.18 | 36.62802   | 0.68 | 138.37251  | 18     | 0.36628    | 68     | 1.38373    |
| 0.19 | 38.66291   | 0.69 | 140.40740  | 19     | 0.38663    | 69     | 1.40407    |
| 0.20 | 40.69780   | 0.70 | 142.44229  | 20     | 0.40698    | 70     | 1.42442    |
| 0.21 | 42.73269   | 0.71 | 144.47718  | 0.0021 | 0.42733    | 0.0071 | 1.44477    |
| 0.22 | 44.76758   | 0.72 | 146.51207  | 22     | 0.44768    | 72     | 1.46512    |
| 0.23 | 46.80247   | 0.73 | 148.54696  | 23     | 0.46802    | 73     | 1.48547    |
| 0.24 | 48.83736   | 0.74 | 150.58185  | 24     | 0.48837    | 74     | 1.50582    |
| 0.25 | 50.87225   | 0.75 | 152.61674  | 25     | 0.50872    | 75     | 1.52617    |
| 0.26 | 52.90714   | 0.76 | 154.65163  | 0.0026 | 0.52907    | 0.0076 | 1.54652    |
| 0.27 | 54.94203   | 0.77 | 156.68652  | 27     | 0.54942    | 77     | 1.56687    |
| 0.28 | 56.97692   | 0.78 | 158.72141  | 28     | 0.56977    | 78     | 1.58721    |
| 0.29 | 59.01181   | 0.79 | 160.75630  | 29     | 0.59012    | 79     | 1.60756    |
| 0.30 | 61.04670   | 0.80 | 162.79119  | 30     | 0.61047    | 80     | 1.62791    |
| 0.31 | 63.08159   | 0.81 | 164.82608  | 0.0031 | 0.63082    | 0.0081 | 1.64826    |
| 0.32 | 65.11648   | 0.82 | 166.86097  | 32     | 0.65116    | 82     | 1.66861    |
| 0.33 | 67.15137   | 0.83 | 168.89586  | 33     | 0.67151    | 83     | 1.68896    |
| 0.34 | 69.18626   | 0.84 | 170.93075  | 34     | 0.69186    | 84     | 1.70931    |
| 0.35 | 71.22115   | 0.85 | 172.96564  | 35     | 0.71221    | 85     | 1.72966    |
| 0.36 | 73.25604   | 0.86 | 175.00053  | 0.0036 | 0.73256    | 0.0086 | 1.75001    |
| 0.37 | 75.29093   | 0.87 | 177.03542  | 37     | 0.75291    | 87     | 1.77035    |
| 0.38 | 77.32582   | 0.88 | 179.07031  | 38     | 0.77326    | 88     | 1.79070    |
| 0.39 | 79.36071   | 0.89 | 181.10520  | 39     | 0.79361    | 89     | 1.81105    |
| 0.40 | 81.39560   | 0.90 | 183.14009  | 40     | 0.81396    | 90     | 1.83140    |
| 0.41 | 83.43049   | 0.91 | 185.17498  | 0.0041 | 0.83430    | 0.0091 | 1.85175    |
| 0.42 | 85.46538   | 0.92 | 187.20987  | 42     | 0.85465    | 92     | 1.87210    |
| 0.43 | 87.50027   | 0.93 | 189.24476  | 43     | 0.87500    | 93     | 1.89245    |
| 0.44 | 89.53516   | 0.94 | 191.27965  | 44     | 0.89535    | 94     | 1.91280    |
| 0.45 | 91.57005   | 0.95 | 193.31454  | 45     | 0.91570    | 95     | 1.93315    |
| 0.46 | 93.60494   | 0.96 | 195.34943  | 0.0046 | 0.93605    | 0.0096 | 1.95349    |
| 0.47 | 95.63983   | 0.97 | 197.38432  | 47     | 0.95640    | 97     | 1.97384    |
| 0.48 | 97.67472   | 0.98 | 199.41921  | 48     | 0.97675    | 98     | 1.99419    |
| 0.49 | 99.70961   | 0.99 | 201.45410  | 49     | 0.99710    | 99     | 2.01454    |
| 0.50 | 101.74450  | 1.00 | 203.48899  | 50     | 1.01745    | 0.0100 | 2.03489    |

For the Arguments A—Q (omitting J), the fraction of a day must be added to the sum of the entries taken from Tables IX, X.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XII

Equation of Longitude

Argument A

| A    | Lq a<br>tio | 3<br>Δ | 4<br>$\frac{1}{2}\Delta$ | A    | Lqua<br>tion | 3<br>Δ | 4<br>$\frac{1}{2}\Delta$ | A    | Lq a<br>tio | 3<br>Δ | 4<br>$\frac{1}{2}\Delta^2$ | A    | Lq a<br>tio | 3<br>Δ | 4<br>$\frac{1}{2}\Delta^2$ |
|------|-------------|--------|--------------------------|------|--------------|--------|--------------------------|------|-------------|--------|----------------------------|------|-------------|--------|----------------------------|
| 0 00 | 48000       | +1694  |                          | 0 50 | 93/88        | - 375  | -31                      | 1 00 | 8 55        | -15 1  | +1                         | 1 50 | 09857       | + 998  | +24                        |
| 0 01 | 49694       | 1694   | - 1                      | 0 51 | 93383        | 434    | 9                        | 1 01 | 26746       | 1495   | 14                         | 1 51 | 10878       | 1046   | 5                          |
| 0 02 | 51387       | 1691   | 3                        | 0 52 | 929 1        | 49     | 8                        | 1 02 | 5 65        | 1467   | 14                         | 1 52 | 11948       | 1 93   | 23                         |
| 0 03 | 53 75       | 1684   | 4                        | 0 53 | 9 4 4        | 546    | 9                        | 1 03 | 381         | 1438   | 16                         | 1 53 | 13063       | 1138   | 3                          |
| 0 04 | 54755       | 1676   | 4                        | 0 54 | 918 9        | 6 3    | 28                       | 1 04 | 2 390       | 1407   | 15                         | 1 54 | 4 3         | 1182   |                            |
| 0 05 | 564 7       | 1666   | 6                        | 0 55 | 91198        | 658    | 7                        | 1 05 | 0998        | 1375   | 18                         | 1 55 | 15426       | 1 4    | 1                          |
| 0 06 | 58088       | +1654  | - 7                      | 0 56 | 9 513        | - 71   | 7                        | 1 06 | 19641       | -1339  | +18                        | 1 56 | 16671       | +1 64  | +19                        |
| 0 07 | 59735       | 1641   | 7                        | 0 57 | 89775        | 765    | 26                       | 1 07 | 18320       | 13 4   | 18                         | 1 57 | 17954       | 1303   | 20                         |
| 0 08 | 61369       | 16 4   | 10                       | 0 58 | 88984        | 817    | 26                       | 1 08 | 17034       | 1 66   | 2                          | 1 58 | 19 77       | 134    | 19                         |
| 0 09 | 6 983       | 1605   | 9                        | 0 59 | 88141        | 870    | 27                       | 1 09 | 15788       | 1 26   | 1                          | 1 59 | 0637        | 1378   | 18                         |
| 0 10 | 64579       | 1585   | 11                       | 0 60 | 87244        | 9 1    | 24                       | 1 10 | 14583       | 1185   | 20                         | 1 60 | 2 3         | 1411   | 16                         |
| 0 11 | 66153       | +156   | -13                      | 0 61 | 86300        | - 968  | -24                      | 1 11 | 13418       | -1144  | +2                         | 1 61 | 23459       | +1443  | +16                        |
| 0 12 | 677         | 1537   | 13                       | 0 62 | 853 8        | 1016   | 4                        | 1 12 | 1 96        | 1 99   | 23                         | 1 62 | 4918        | 1474   | 15                         |
| 0 13 | 69 6        | 151    | 14                       | 0 63 | 84 68        | 106    |                          | 1 13 | 11 20       | 1054   | 23                         | 1 63 | 6407        | 1503   | 14                         |
| 0 14 | 707 2       | 148    | 15                       | 0 64 | 83184        | 1107   | 3                        | 1 14 | 1 189       | 1008   | 4                          | 1 64 | 7923        | 15 9   | 13                         |
| 0 15 | 7 189       | 1451   | 17                       | 0 65 | 8 055        | 1151   | 22                       | 1 15 | 09 05       | 960    | 5                          | 1 65 | 9465        | 1554   | 1                          |
| 0 16 | 736 3       | +1418  | -17                      | 0 66 | 80882        | 1193   | -20                      | 1 16 | 8 70        | - 911  | + 5                        | 1 66 | 31031       | +1577  | +11                        |
| 0 17 | 750 4       | 1384   | 18                       | 0 67 | 79670        | 1 33   | 1                        | 1 17 | 07384       | 860    | 26                         | 1 67 | 3 618       | 1597   | 10                         |
| 0 18 | 76390       | 1347   | 19                       | 0 68 | 78416        | 1 74   |                          | 1 18 | 0655        | 809    | 25                         | 1 68 | 34225       | 1616   | 9                          |
| 0 19 | 77718       | 13 9   | 19                       | 0 69 | 771 3        | 1311   | 18                       | 1 19 | 5767        | 757    | 27                         | 1 69 | 35850       | 1633   | 8                          |
| 0 20 | 790 8       | 1 7    |                          | 0 70 | 75795        | 1346   | 18                       | 1 20 | 05 37       | 704    | 27                         | 1 70 | 37490       | 1647   | 7                          |
| 0 21 | 80 58       | +1 9   | - 1                      | 0 71 | 74431        | -1381  | -16                      | 1 21 | 04360       | - 649  | +29                        | 1 71 | 39143       | +1659  | + 6                        |
| 0 22 | 81466       | 1 86   | 23                       | 0 72 | 73033        | 1414   | 16                       | 1 22 | 03740       | 594    | 7                          | 1 72 | 4 808       | 167    | 5                          |
| 0 23 | 8 6 9       | 1141   |                          | 0 73 | 71604        | 1444   | 15                       | 1 23 | 03173       | 539    | 9                          | 1 73 | 4248        | 1678   | 4                          |
| 0 24 | 83748       | 1095   | 4                        | 0 74 | 70146        | 147    | 14                       | 1 24 | 663         | 48     | 9                          | 1 74 | 44163       | 1683   | 2                          |
| 0 25 | 848 9       | 1048   | 4                        | 0 75 | 68661        | 1499   | 14                       | 1 25 | 10          | 4 4    | 30                         | 1 75 | 45848       | 1687   |                            |
| 0 26 | 85843       | +1     | -24                      | 0 76 | 67148        | -15 5  | -1                       | 1 26 | 01816       | - 366  | +29                        | 1 76 | 47537       | +1690  | + 1                        |
| 0 27 | 86819       | 950    | 26                       | 0 77 | 6561         | 1548   | 1                        | 1 27 | 01479       | 307    | 30                         | 1 77 | 492 8       | 1690   | - 2                        |
| 0 28 | 87743       | 899    | 5                        | 0 78 | 64053        | 1569   | 10                       | 1 28 | 01 02       | 49     | 29                         | 1 78 | 50916       | 1686   |                            |
| 0 29 | 88617       | 848    | 7                        | 0 79 | 62475        | 1587   | 9                        | 1 29 | 0098        | 191    | 30                         | 1 79 | 5 600       | 168    | 3                          |
| 0 30 | 89438       | 795    | 7                        | 0 80 | 60879        | 1605   | 9                        | 1 30 | 008 1       | 131    | 30                         | 1 80 | 54279       | 1675   | 5                          |
| 0 31 | 9 06        | + 741  | -28                      | 0 81 | 59 65        | -16 1  | - 7                      | 1 31 | 007 0       | - 71   | +30                        | 1 81 | 55949       | +1666  | - 5                        |
| 0 32 | 9 919       | 686    | 28                       | 0 82 | 57637        | 1634   | 6                        | 1 32 | 0679        | - 12   | 29                         | 1 82 | 57609       | 1655   | 6                          |
| 0 33 | 9 577       | 630    | 9                        | 0 83 | 55997        | 1645   | 5                        | 1 33 | 00696       | + 48   | 31                         | 1 83 | 59 58       | 1641   | 8                          |
| 0 34 | 9 178       | 573    | 9                        | 0 84 | 54347        | 1654   | 4                        | 1 34 | 0775        | 108    | 9                          | 1 84 | 60891       | 16 5   | 8                          |
| 0 35 | 9 7         | 515    | 9                        | 0 85 | 5 69         | 1661   | 4                        | 1 35 | 0091        | 167    | 3                          | 1 85 | 6 508       | 1608   | 9                          |
| 0 36 | 93 8        | + 457  | - 9                      | 0 86 | 510 6        | -1667  | - 3                      | 1 36 | 1109        | + 7    | +30                        | 1 86 | 64107       | +1588  | -11                        |
| 0 37 | 93636       | 399    | 9                        | 0 87 | 49357        | 167    | - 1                      | 1 37 | 01365       | 86     | 3                          | 1 87 | 65684       | 1567   | 11                         |
| 0 38 | 94006       | 34     | 3                        | 0 88 | 47687        | 167    |                          | 1 38 | 01680       | 345    | 30                         | 1 88 | 67 40       | 1544   | 13                         |
| 0 39 | 94316       | 81     | 9                        | 0 89 | 46017        | 1669   | +                        | 1 39 | 02 55       | 403    | 8                          | 1 89 | 68771       | 1518   | 14                         |
| 0 40 | 94568       | 22     | 31                       | 0 90 | 44350        | 1665   |                          | 1 40 | 02486       | 461    | 30                         | 1 90 | 7 275       | 1489   | 15                         |
| 0 41 | 94759       | + 161  | - 3                      | 0 91 | 4 687        | -1660  | + 3                      | 1 41 | 0 976       | + 519  | + 9                        | 1 91 | 71749       | +1460  | -15                        |
| 0 42 | 94890       | 10     | 30                       | 0 92 | 41030        | 165    | 5                        | 1 42 | 03523       | 575    | 8                          | 1 92 | 73194       | 14 9   | 16                         |
| 0 43 | 9496        | + 42   | 30                       | 0 93 | 39383        | 1641   | 6                        | 1 43 | 041 6       | 631    | 8                          | 1 93 | 746 7       | 1396   | 17                         |
| 0 44 | 94974       | - 9    | 31                       | 0 94 | 37746        | 1630   | 5                        | 1 44 | 04784       | 687    | 8                          | 1 94 | 75986       | 1361   | 18                         |
| 0 45 | 949 5       | 79     | 3                        | 0 95 | 361 1        | 1618   | 7                        | 1 45 | 05499       | 74     | 27                         | 1 95 | 77329       | 1324   | 19                         |
| 0 46 | 94816       | - 139  | -30                      | 0 96 | 34510        | -1603  | + 9                      | 1 46 | 6267        | + 794  | +26                        | 1 96 | 78634       | +1286  | -20                        |
| 0 47 | 94647       | 199    | 30                       | 0 97 | 3 916        | 1585   | 10                       | 1 47 | 07087       | 846    | 26                         | 1 97 | 799 0       | 1 46   | 0                          |
| 0 48 | 94419       | 258    | 3                        | 0 98 | 31341        | 1564   | 11                       | 1 48 | 07959       | 898    | 6                          | 1 98 | 811 6       | 1 05   | 21                         |
| 0 49 | 9413        | 316    | 9                        | 0 99 | 9788         | 1543   | 10                       | 1 49 | 08883       | 949    | 25                         | 1 99 | 8 310       | 1162   |                            |
| 0 50 | 93788       | - 375  | -31                      | 1 00 | 8 55         | -15 1  | +1                       | 1 50 | 09857       | + 998  | +24                        | 2 00 | 8345        | +1117  | - 3                        |

Add 10 t t 8000

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Equation of Longitude

Argument A

| 1    | 2             | 3        | 4                      | 1    | 2             | 3        | 4                      | 1    | 2             | 3        | 4                      | 1    | 2             | 3        | 4                      |
|------|---------------|----------|------------------------|------|---------------|----------|------------------------|------|---------------|----------|------------------------|------|---------------|----------|------------------------|
| A    | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ | A    | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ | A    | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ | A    | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ |
| d    | °             |          |                        | d    | °             |          |                        | d    | °             |          |                        | d    | °             |          |                        |
| 2'00 | '83450        | +1117    | -23                    | 2'50 | '71530        | -1450    | -13                    | 3'00 | '03355        | -522     | +29                    | 3'50 | '43691        | +1687    | +3                     |
| 2'01 | '84544        | 1071     | 23                     | 2'51 | '70067        | 1478     | 15                     | 3'01 | '02862        | 464      | 29                     | 3'51 | '45380        | 1692     | +3                     |
| 2'02 | '85592        | 1024     | 24                     | 2'52 | '68574        | 1506     | 13                     | 3'02 | '02427        | 406      | 29                     | 3'52 | '47075        | 1695     | -1                     |
| 2'03 | '86592        | 976      | 24                     | 2'53 | '67055        | 1531     | 12                     | 3'03 | '02050        | 348      | 30                     | 3'53 | '48769        | 1694     | 1                      |
| 2'04 | '87544        | 926      | 26                     | 2'54 | '65512        | 1554     | 11                     | 3'04 | '01732        | 289      | 29                     | 3'54 | '50462        | 1692     | 1                      |
| 2'05 | '88444        | 875      | 26                     | 2'55 | '63948        | 1574     | 10                     | 3'05 | '01472        | 231      | 30                     | 3'55 | '52153        | 1688     | 3                      |
| 2'06 | '89293        | +823     | -27                    | 2'56 | '62365        | -1593    | -10                    | 3'06 | '01271        | -172     | +30                    | 3'56 | '53838        | +1682    | -4                     |
| 2'07 | '90089        | 770      | 26                     | 2'57 | '60763        | 1610     | 8                      | 3'07 | '01129        | 112      | 30                     | 3'57 | '55516        | 1673     | 6                      |
| 2'08 | '90833        | 716      | 28                     | 2'58 | '59146        | 1624     | 7                      | 3'08 | '01047        | -52      | 31                     | 3'58 | '57183        | 1661     | 7                      |
| 2'09 | '91521        | 661      | 28                     | 2'59 | '57515        | 1637     | 6                      | 3'09 | '01026        | +9       | 30                     | 3'59 | '58837        | 1648     | 6                      |
| 2'10 | '92154        | 606      | 28                     | 2'60 | '55873        | 1648     | 6                      | 3'10 | '01065        | 69       | 30                     | 3'60 | '60479        | 1634     | 9                      |
| 2'11 | '92732        | +550     | -29                    | 2'61 | '54220        | -1658    | -5                     | 3'11 | '01164        | +128     | +29                    | 3'61 | '62104        | +1615    | -10                    |
| 2'12 | '93253        | 493      | 28                     | 2'62 | '52558        | 1664     | 2                      | 3'12 | '01321        | 188      | 31                     | 3'62 | '63709        | 1596     | 9                      |
| 2'13 | '93718        | 436      | 30                     | 2'63 | '50893        | 1666     | 1                      | 3'13 | '01539        | 248      | 30                     | 3'63 | '65296        | 1576     | 12                     |
| 2'14 | '94124        | 377      | 30                     | 2'64 | '49226        | 1670     | -3                     | 3'14 | '01817        | 308      | 30                     | 3'64 | '66860        | 1551     | 13                     |
| 2'15 | '94471        | 318      | 30                     | 2'65 | '47554        | 1671     | +1                     | 3'15 | '02154        | 367      | 30                     | 3'65 | '68398        | 1525     | 14                     |
| 2'16 | '94759        | +259     | -30                    | 2'66 | '45884        | -1669    | +2                     | 3'16 | '02551        | +426     | +29                    | 3'66 | '69909        | +1497    | -14                    |
| 2'17 | '94988        | 200      | 29                     | 2'67 | '44217        | 1664     | 3                      | 3'17 | '03005        | 484      | 30                     | 3'67 | '71392        | 1468     | 15                     |
| 2'18 | '95159        | 140      | 31                     | 2'68 | '42556        | 1658     | 3                      | 3'18 | '03519        | 542      | 28                     | 3'68 | '72845        | 1436     | 17                     |
| 2'19 | '95268        | 81       | 29                     | 2'69 | '40901        | 1650     | 5                      | 3'19 | '04089        | 599      | 29                     | 3'69 | '74264        | 1402     | 17                     |
| 2'20 | '95320        | +21      | 31                     | 2'70 | '39256        | 1640     | 6                      | 3'20 | '04716        | 655      | 28                     | 3'70 | '75649        | 1367     | 19                     |
| 2'21 | '95310        | -39      | -29                    | 2'71 | '37622        | -1628    | +7                     | 3'21 | '05398        | +710     | +28                    | 3'71 | '76997        | +1330    | -18                    |
| 2'22 | '95243        | 98       | 31                     | 2'72 | '36001        | 1614     | 7                      | 3'22 | '06136        | 765      | 27                     | 3'72 | '78309        | 1292     | 20                     |
| 2'23 | '95115        | 158      | 30                     | 2'73 | '34394        | 1598     | 9                      | 3'23 | '06928        | 819      | 27                     | 3'73 | '79581        | 1251     | 21                     |
| 2'24 | '94927        | 217      | 29                     | 2'74 | '32806        | 1579     | 9                      | 3'24 | '07774        | 871      | 25                     | 3'74 | '80811        | 1209     | 22                     |
| 2'25 | '94681        | 276      | 30                     | 2'75 | '31236        | 1560     | 11                     | 3'25 | '08670        | 922      | 26                     | 3'75 | '81998        | 1165     | 22                     |
| 2'26 | '94375        | -335     | -29                    | 2'76 | '29687        | -1537    | +12                    | 3'26 | '09617        | +972     | +25                    | 3'76 | '83141        | +1121    | -23                    |
| 2'27 | '94012        | 392      | 29                     | 2'77 | '28162        | 1513     | 12                     | 3'27 | '10614        | 1022     | 25                     | 3'77 | '84239        | 1075     | 24                     |
| 2'28 | '93591        | 450      | 29                     | 2'78 | '26661        | 1487     | 14                     | 3'28 | '11661        | 1070     | 23                     | 3'78 | '85290        | 1027     | 24                     |
| 2'29 | '93112        | 507      | 28                     | 2'79 | '25188        | 1459     | 14                     | 3'29 | '12754        | 1117     | 24                     | 3'79 | '86293        | 978      | 25                     |
| 2'30 | '92577        | 563      | 28                     | 2'80 | '23743        | 1430     | 16                     | 3'30 | '13894        | 1162     | 22                     | 3'80 | '87246        | 928      | 26                     |
| 2'31 | '91986        | -619     | -28                    | 2'81 | '22329        | -1399    | +16                    | 3'31 | '15077        | +1205    | +22                    | 3'81 | '88148        | +876     | -26                    |
| 2'32 | '91340        | 674      | 28                     | 2'82 | '20946        | 1366     | 18                     | 3'32 | '16304        | 1247     | 20                     | 3'82 | '88998        | 823      | 27                     |
| 2'33 | '90639        | 728      | 27                     | 2'83 | '19598        | 1330     | 19                     | 3'33 | '17571        | 1288     | 21                     | 3'83 | '89794        | 770      | 27                     |
| 2'34 | '89885        | 781      | 27                     | 2'84 | '18287        | 1294     | 18                     | 3'34 | '18879        | 1328     | 20                     | 3'84 | '90537        | 716      | 28                     |
| 2'35 | '89078        | 833      | 26                     | 2'85 | '17011        | 1256     | 20                     | 3'35 | '20226        | 1365     | 18                     | 3'85 | '91225        | 660      | 28                     |
| 2'36 | '88220        | -883     | -25                    | 2'86 | '15775        | -1216    | +21                    | 3'36 | '21608        | +1399    | +17                    | 3'86 | '91857        | +604     | -29                    |
| 2'37 | '87312        | 933      | 25                     | 2'87 | '14580        | 1174     | 21                     | 3'37 | '23024        | 1433     | 17                     | 3'87 | '92432        | 547      | 28                     |
| 2'38 | '86355        | 981      | 24                     | 2'88 | '13427        | 1131     | 22                     | 3'38 | '24474        | 1465     | 15                     | 3'88 | '92951        | 489      | 30                     |
| 2'39 | '85350        | 1029     | 24                     | 2'89 | '12318        | 1087     | 22                     | 3'39 | '25954        | 1494     | 14                     | 3'89 | '93410        | 430      | 29                     |
| 2'40 | '84297        | 1075     | 22                     | 2'90 | '11253        | 1042     | 24                     | 3'40 | '27462        | 1522     | 14                     | 3'90 | '93811        | 372      | 30                     |
| 2'41 | '83200        | -1119    | -22                    | 2'91 | '10235        | -995     | +24                    | 3'41 | '28997        | +1548    | +13                    | 3'91 | '94153        | +313     | -29                    |
| 2'42 | '82060        | 1162     | 22                     | 2'92 | '09264        | 947      | 25                     | 3'42 | '30558        | 1573     | 12                     | 3'92 | '94437        | 254      | 30                     |
| 2'43 | '80876        | 1205     | 21                     | 2'93 | '08342        | 896      | 26                     | 3'43 | '32142        | 1594     | 10                     | 3'93 | '94661        | 194      | 30                     |
| 2'44 | '79651        | 1245     | 20                     | 2'94 | '07472        | 846      | 25                     | 3'44 | '33746        | 1614     | 10                     | 3'94 | '94825        | 134      | 30                     |
| 2'45 | '78387        | 1284     | 20                     | 2'95 | '06651        | 794      | 27                     | 3'45 | '35370        | 1632     | 8                      | 3'95 | '94929        | 74       | 30                     |
| 2'46 | '77084        | -1321    | -18                    | 2'96 | '05884        | -741     | +26                    | 3'46 | '37009        | +1647    | +8                     | 3'96 | '94973        | +14      | -30                    |
| 2'47 | '75746        | 1356     | 18                     | 2'97 | '05169        | 688      | 27                     | 3'47 | '38664        | 1661     | 6                      | 3'97 | '94957        | -46      | 30                     |
| 2'48 | '74373        | 1390     | 17                     | 2'98 | '04508        | 632      | 29                     | 3'48 | '40331        | 1672     | 5                      | 3'98 | '94881        | 106      | 30                     |
| 2'49 | '72967        | 1422     | 16                     | 2'99 | '03905        | 577      | 27                     | 3'49 | '42007        | 1680     | 4                      | 3'99 | '94746        | 163      | 28                     |
| 2'50 | '71530        | -1450    | -13                    | 3'00 | '03355        | -522     | +29                    | 3'50 | '43691        | +1687    | +3                     | 4'00 | '94555        | -220     | -29                    |

Added Constant: 0°48000.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XIII

Equations of Longitude

XIV

| B    | Equation | $\Delta$<br>o d r |
|------|----------|-------------------|
| 0 00 | 0 0300   | + 4 0             |
| 05   | 3 0      | 3 5               |
| 10   | 336      | 2 7               |
| 15   | 347      | + 1 0             |
| 20   | 35       | - 3               |
| 25   | 344      | 0                 |
| 0 30 | 0 0329   | - 4 0             |
| 35   | 3 5      | 5 5               |
| 40   | 273      | 7 3               |
| 45   | 235      | 7 5               |
| 50   | 196      | 8 0               |
| 0 55 | 0 00156  | - 8 0             |
| 60   | 119      | 6 8               |
| 65   | 88       | 5 5               |
| 70   | 65       | 4 0               |
| 75   | 51       | - 1 5             |
| 0 80 | 0 00048  | + 0 3             |
| 85   | 55       | 2 5               |
| 90   | 73       | 4 3               |
| 95   | 1 0      | 6 0               |
| 1 00 | 135      | 7 7               |
| 1 05 | 0 178    | + 9 0             |
| 10   | 4        | 9 8               |
| 15   | 74       | 10 5              |
| 20   | 3 5      | 1 3               |
| 25   | 375      | 1 0               |
| 1 30 | 0 004    | + 9               |
| 35   | 464      | 8 0               |
| 40   | 500      | 6 3               |
| 45   | 5 7      | 4 5               |
| 50   | 545      | 5                 |
| 1 55 | 0 0055   | + 5               |
| 60   | 549      | - 1 8             |
| 65   | 535      | 3 5               |
| 70   | 51       | 5 3               |
| 75   | 481      | 7 0               |
| 1 80 | 0 0 444  | - 7 8             |
| 85   | 405      | 8 0               |
| 90   | 365      | 8 0               |
| 95   | 3 8      | 7 0               |
| 2 00 | 96       | 5 7               |
| 2 05 | 00 7     | - 4 0             |
| 10   | 56       | - 2 3             |
| 15   | 250      | 0 0               |
| 20   | 253      | + 1 5             |
| 25   | 64       | 3 0               |
| 2 30 | 0 00280  | + 3 8             |
| 35   | 300      | 4 0               |
| 40   | 319      | 3 5               |
| 45   | 336      | 3 0               |
| 2 50 | 0 00347  | + 1 3             |

Add C t t 300

| C    | Equation | $\Delta$<br>o d o | C    | Equation | $\Delta$<br>o d r |
|------|----------|-------------------|------|----------|-------------------|
| 0 00 | 0 00600  | + 18 9            | 1 00 | 0 00389  | - 17 4            |
| 02   | 638      | 18 9              | 02   | 355      | 16 8              |
| 04   | 675      | 18 7              | 04   | 3        | 16 1              |
| 06   | 713      | 18 5              | 06   | 9        | 15 4              |
| 08   | 749      | 18 1              | 08   | 6        | 14 5              |
| 10   | 785      | 17 7              | 10   | 32       | 13 7              |
| 0 12 | 0 008    | + 17              | 1 12 | 002 6    | - 1 8             |
| 14   | 854      | 16 6              | 14   | 181      | 11 7              |
| 16   | 886      | 15 9              | 16   | 159      | 10 6              |
| 18   | 918      | 15                | 18   | 139      | 9 5               |
| 20   | 947      | 14 3              | 20   | 1 1      | 8 3               |
| 0 22 | 0 00975  | + 13 4            | 1 22 | 0 00106  | - 7 1             |
| 24   | 1001     | 1 5               | 24   | 93       | 5 8               |
| 26   | 1025     | 11 4              | 26   | 83       | 4 5               |
| 28   | 1 46     | 10 3              | 28   | 75       | 3 2               |
| 30   | 1066     | 9 2               | 30   | 70       | 1 9               |
| 0 32 | 0 01083  | + 8 0             | 1 32 | 00068    | 0 5               |
| 34   | 1097     | 6 7               | 34   | 69       | + 0 8             |
| 36   | 11 9     | 5 5               | 36   | 72       | 2                 |
| 38   | 1119     | 4                 | 38   | 78       | 3 5               |
| 40   | 1126     | 9                 | 40   | 86       | 4 8               |
| 0 42 | 0 01130  | + 1 5             | 1 42 | 0 00 97  | + 6 1             |
| 44   | 113      | +                 | 44   | 110      | 7 3               |
| 46   | 1131     | - 1 2             | 46   | 1 6      | 8 6               |
| 48   | 11 7     | 5                 | 48   | 144      | 9 7               |
| 50   | 11 1     | 3 8               | 50   | 165      | 10 9              |
| 0 52 | 0 01112  | - 5 1             | 1 52 | 0 0188   | + 11 9            |
| 54   | 1101     | 6 4               | 54   | 21       | 1 9               |
| 56   | 1087     | 7 7               | 56   | 39       | 13 9              |
| 58   | 1070     | 8 9               | 58   | 268      | 14 7              |
| 60   | 1051     | 10 0              | 60   | 98       | 15 5              |
| 0 62 | 0 01030  | - 11 1            | 1 62 | 0 00330  | + 16 3            |
| 64   | 1007     | 12 2              | 64   | 363      | 16 9              |
| 66   | 981      | 13 2              | 66   | 398      | 17 5              |
| 68   | 954      | 14 1              | 68   | 43       | 17 9              |
| 70   | 9 5      | 15 0              | 70   | 468      | 18 3              |
| 0 72 | 0 894    | - 15 7            | 1 72 | 0 00506  | + 18 6            |
| 74   | 86       | 16 4              | 74   | 543      | 18 8              |
| 76   | 8 9      | 17 1              | 76   | 580      | 18 9              |
| 78   | 794      | 17 6              | 78   | 618      | 18 9              |
| 80   | 758      | 18 0              | 80   | 656      | 18 8              |
| 0 82 | 0 00722  | - 18 4            | 1 82 | 0 00693  | + 18 6            |
| 84   | 685      | 18 7              | 84   | 730      | 18 3              |
| 86   | 647      | 18 8              | 86   | 767      | 18 0              |
| 88   | 6 9      | 18 9              | 88   | 80       | 17 5              |
| 90   | 57       | 18 9              | 90   | 836      | 16 9              |
| 0 92 | 0 00534  | - 18 7            | 1 92 | 0087     | + 16 3            |
| 94   | 497      | 18 5              | 94   | 902      | 15 6              |
| 96   | 46       | 18                | 96   | 932      | 14 8              |
| 98   | 424      | 17 8              | 98   | 961      | 13 9              |
| 1 00 | 0 00389  | - 17 4            | 2 00 | 0 00987  | + 13 0            |

Add C t t 006

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XV

Equations of Longitude

XVI

| 1                 | 2                    | 3   | 1                 | 2                    | 3   |
|-------------------|----------------------|---|-------------------|----------------------|---|
| D                 | Equation             | $\Delta$<br>0 <sup>d</sup> 0 <sup>i</sup> | D                 | Equation             | $\Delta$<br>0 <sup>d</sup> 0 <sup>i</sup> |
| d                 | o                    |   | d                 | o                    |   |
| 0 <sup>h</sup> 00 | 0 <sup>m</sup> 00500 | + 15,1                                    | 1 <sup>h</sup> 00 | 0 <sup>m</sup> 00330 | - 13,9                                    |
| 02                | 530                  | 15,1                                      | 02                | 303                  | 13,4                                      |
| 04                | 560                  | 14,9                                      | 04                | 276                  | 12,9                                      |
| 06                | 590                  | 14,8                                      | 06                | 251                  | 12,3                                      |
| 08                | 619                  | 14,5                                      | 08                | 227                  | 11,6                                      |
| 10                | 648                  | 14,1                                      | 10                | 205                  | 10,9                                      |
| 0 <sup>h</sup> 12 | 0 <sup>m</sup> 00676 | + 13,7                                    | 1 <sup>h</sup> 12 | 0 <sup>m</sup> 00184 | - 10,1                                    |
| 14                | 703                  | 13,3                                      | 14                | 164                  | 9,3                                       |
| 16                | 729                  | 12,7                                      | 16                | 147                  | 8,5                                       |
| 18                | 754                  | 12,1                                      | 18                | 131                  | 7,5                                       |
| 20                | 777                  | 11,5                                      | 20                | 117                  | 6,6                                       |
| 0 <sup>h</sup> 22 | 0 <sup>m</sup> 00799 | + 10,7                                    | 1 <sup>h</sup> 22 | 0 <sup>m</sup> 00104 | - 5,6                                     |
| 24                | 820                  | 10,0                                      | 24                | 94                   | 4,6                                       |
| 26                | 839                  | 9,1                                       | 26                | 86                   | 3,6                                       |
| 28                | 857                  | 8,2                                       | 28                | 80                   | 2,5                                       |
| 30                | 872                  | 7,3                                       | 30                | 76                   | 1,5                                       |
| 0 <sup>h</sup> 32 | 0 <sup>m</sup> 00886 | + 6,4                                     | 1 <sup>h</sup> 32 | 0 <sup>m</sup> 00074 | - 0,4                                     |
| 34                | 898                  | 5,4                                       | 34                | 74                   | + 0,7                                     |
| 36                | 907                  | 4,4                                       | 36                | 76                   | 1,8                                       |
| 38                | 915                  | 3,3                                       | 38                | 81                   | 2,8                                       |
| 40                | 921                  | 2,3                                       | 40                | 88                   | 3,9                                       |
| 0 <sup>h</sup> 42 | 0 <sup>m</sup> 00924 | + 1,2                                     | 1 <sup>h</sup> 42 | 0 <sup>m</sup> 00097 | + 4,9                                     |
| 44                | 925                  | + 0,1                                     | 44                | 107                  | 5,9                                       |
| 46                | 924                  | - 1,0                                     | 46                | 120                  | 6,9                                       |
| 48                | 921                  | 2,0                                       | 48                | 135                  | 7,8                                       |
| 50                | 916                  | 3,1                                       | 50                | 151                  | 8,7                                       |
| 0 <sup>h</sup> 52 | 0 <sup>m</sup> 00909 | - 4,1                                     | 1 <sup>h</sup> 52 | 0 <sup>m</sup> 00170 | + 9,6                                     |
| 54                | 900                  | 5,1                                       | 54                | 190                  | 10,4                                      |
| 56                | 889                  | 6,1                                       | 56                | 211                  | 11,1                                      |
| 58                | 875                  | 7,1                                       | 58                | 234                  | 11,8                                      |
| 60                | 860                  | 8,0                                       | 60                | 258                  | 12,5                                      |
| 0 <sup>h</sup> 62 | 0 <sup>m</sup> 00843 | - 8,9                                     | 1 <sup>h</sup> 62 | 0 <sup>m</sup> 00284 | + 13,0                                    |
| 64                | 825                  | 9,8                                       | 64                | 310                  | 13,5                                      |
| 66                | 804                  | 10,5                                      | 66                | 338                  | 14,0                                      |
| 68                | 783                  | 11,3                                      | 68                | 367                  | 14,4                                      |
| 70                | 759                  | 12,0                                      | 70                | 396                  | 14,6                                      |
| 0 <sup>h</sup> 72 | 0 <sup>m</sup> 00735 | - 12,7                                    | 1 <sup>h</sup> 72 | 0 <sup>m</sup> 00425 | + 14,9                                    |
| 74                | 709                  | 13,2                                      | 74                | 455                  | 15,0                                      |
| 76                | 682                  | 13,6                                      | 76                | 485                  | 15,1                                      |
| 78                | 654                  | 14,1                                      | 78                | 516                  | 15,1                                      |
| 80                | 626                  | 14,4                                      | 80                | 546                  | 15,0                                      |
| 0 <sup>h</sup> 82 | 0 <sup>m</sup> 00597 | - 14,7                                    | 1 <sup>h</sup> 82 | 0 <sup>m</sup> 00576 | + 14,9                                    |
| 84                | 567                  | 14,9                                      | 84                | 605                  | 14,6                                      |
| 86                | 537                  | 15,1                                      | 86                | 634                  | 14,3                                      |
| 88                | 507                  | 15,1                                      | 88                | 663                  | 14,0                                      |
| 90                | 477                  | 15,1                                      | 90                | 690                  | 13,5                                      |
| 0 <sup>h</sup> 92 | 0 <sup>m</sup> 00446 | - 15,0                                    | 1 <sup>h</sup> 92 | 0 <sup>m</sup> 00717 | + 13,0                                    |
| 94                | 417                  | 14,8                                      | 94                | 742                  | 12,4                                      |
| 96                | 387                  | 14,6                                      | 96                | 766                  | 11,8                                      |
| 98                | 358                  | 14,2                                      | 98                | 789                  | 11,1                                      |
| 1 <sup>h</sup> 00 | 0 <sup>m</sup> 00330 | - 13,9                                    | 2 <sup>h</sup> 00 | 0 <sup>m</sup> 00811 | + 10,3                                    |

Added Constant: 0<sup>m</sup>00500.

| 1                 | 2                    | 3   |
|-------------------|----------------------|---|
| E                 | Equation             | $\Delta$<br>0 <sup>d</sup> 0 <sup>i</sup> |
| d                 | o                    |   |
| 0 <sup>h</sup> 00 | 0 <sup>m</sup> 00200 | + 6,8                                     |
| 04                | 227                  | 6,7                                       |
| 08                | 253                  | 6,5                                       |
| 12                | 279                  | 6,2                                       |
| 16                | 302                  | 5,7                                       |
| 20                | 324                  | 5,1                                       |
| 0 <sup>h</sup> 24 | 0 <sup>m</sup> 00343 | + 4,4                                     |
| 28                | 359                  | 3,7                                       |
| 32                | 372                  | 2,8                                       |
| 36                | 382                  | 1,9                                       |
| 40                | 388                  | 1,0                                       |
| 0 <sup>h</sup> 44 | 0 <sup>m</sup> 00390 | + 0,1                                     |
| 48                | 389                  | - 0,9                                     |
| 52                | 383                  | 1,8                                       |
| 56                | 374                  | 2,7                                       |
| 60                | 361                  | 3,6                                       |
| 0 <sup>h</sup> 64 | 0 <sup>m</sup> 00345 | - 4,4                                     |
| 68                | 326                  | 5,1                                       |
| 72                | 305                  | 5,6                                       |
| 76                | 281                  | 6,1                                       |
| 80                | 256                  | 6,4                                       |
| 0 <sup>h</sup> 84 | 0 <sup>m</sup> 00230 | - 6,7                                     |
| 88                | 203                  | 6,8                                       |
| 92                | 176                  | 6,7                                       |
| 96                | 150                  | 6,5                                       |
| 1 <sup>h</sup> 00 | 124                  | 6,2                                       |
| 1 <sup>h</sup> 04 | 0 <sup>m</sup> 00100 | - 5,7                                     |
| 08                | 78                   | 5,2                                       |
| 12                | 59                   | 4,5                                       |
| 16                | 42                   | 3,8                                       |
| 20                | 29                   | 2,9                                       |
| 1 <sup>h</sup> 24 | 0 <sup>m</sup> 00019 | - 2,0                                     |
| 28                | 12                   | 1,1                                       |
| 32                | 10                   | - 0,2                                     |
| 36                | 11                   | + 0,8                                     |
| 40                | 16                   | 1,7                                       |
| 1 <sup>h</sup> 44 | 0 <sup>m</sup> 00025 | + 2,6                                     |
| 48                | 37                   | 3,5                                       |
| 52                | 53                   | 4,3                                       |
| 56                | 71                   | 5,0                                       |
| 60                | 92                   | 5,6                                       |
| 1 <sup>h</sup> 64 | 0 <sup>m</sup> 00116 | + 6,1                                     |
| 68                | 141                  | 6,4                                       |
| 72                | 167                  | 6,7                                       |
| 76                | 194                  | 6,8                                       |
| 80                | 221                  | 6,7                                       |
| 1 <sup>h</sup> 84 | 0 <sup>m</sup> 00248 | + 6,5                                     |
| 88                | 273                  | 6,2                                       |
| 92                | 297                  | 5,8                                       |
| 96                | 319                  | 5,3                                       |
| 2 <sup>h</sup> 00 | 0 <sup>m</sup> 00339 | + 4,6                                     |

Added Constant: 0<sup>m</sup>00200.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XVII

Equations of Longitude

XVIII

|     |          | 3          |                  |          | 3             |
|-----|----------|------------|------------------|----------|---------------|
| F   | Equation | $\Delta_r$ | F                | Equation | $\Delta_{rd}$ |
| 0   | 0 800    | - 11 3     | <sup>d</sup> 250 | 0 01303  | + 8 1         |
| 5   | 743      | 11         | 255              | 134      | 7 4           |
| 10  | 688      | 11 1       | 260              | 1377     | 6 8           |
| 15  | 63       | 11         | 265              | 14 9     | 6             |
| 20  | 579      | 10 7       | 270              | 1437     | 5 3           |
| 25  | 5 5      | 1 4        | 275              | 1462     | 4 5           |
| 30  | 0 474    | - 10       | 280              | 0 1481   | + 3 6         |
| 35  | 4 5      | 9 7        | 285              | 1498     | 8             |
| 40  | 378      | 9 1        | 290              | 1509     | 1 9           |
| 45  | 334      | 8 6        | 295              | 1517     | 1 1           |
| 50  | 93       | 8 0        | 300              | 1520     | + 0 1         |
| 55  | 0 00 54  | - 7 3      | 305              | 0 01518  | - 0 8         |
| 60  | 19       | 6 6        | 310              | 1513     | 1 6           |
| 65  | 188      | 5 9        | 315              | 15       | 5             |
| 70  | 160      | 5          | 320              | 1488     | 3 3           |
| 75  | 136      | 4 4        | 325              | 1469     | 4             |
| 80  | 0 0 116  | - 3 5      | 330              | 0 01446  | - 5 0         |
| 85  | 1 1      | 2 7        | 335              | 1419     | 5 7           |
| 90  | 9        | 1 8        | 340              | 1389     | 6 5           |
| 95  | 83       | - 0 9      | 345              | 1355     | 7             |
| 100 | 8        | 0 0        | 350              | 1317     | 7 8           |
| 105 | 0 00082  | + 0 8      | 355              | 0 01 77  | - 8 5         |
| 110 | 88       | 7          | 360              | 1 33     | 9 0           |
| 115 | 98       | 6          | 365              | 1187     | 9 5           |
| 120 | 113      | 3 4        | 370              | 1138     | 10            |
| 125 | 133      | 4 3        | 375              | 1087     | 10 3          |
| 130 | 0 00156  | + 5        | 380              | 0 01035  | - 10 7        |
| 135 | 184      | 5 9        | 385              | 981      | 10 9          |
| 140 | 15       | 6 6        | 390              | 926      | 11 1          |
| 145 | 49       | 7 3        | 395              | 87       | 11            |
| 150 | 287      | 8 0        | 400              | 813      | 11 3          |
| 155 | 0 003 8  | + 8 5      | 405              | 0 00757  | - 11 2        |
| 160 | 37       | 9 1        | 410              | 7 1      | 11            |
| 165 | 418      | 9 6        | 415              | 645      | 11 0          |
| 170 | 468      | 10 0       | 420              | 591      | 10 8          |
| 175 | 518      | 10 4       | 425              | 537      | 10 5          |
| 180 | 057      | + 1 7      | 430              | 0 00486  | - 1 1         |
| 185 | 6 6      | 10 9       | 435              | 436      | 9 7           |
| 190 | 681      | 11         | 440              | 389      | 9 3           |
| 195 | 737      | 11         | 445              | 344      | 8 7           |
| 200 | 793      | 11 3       | 450              | 30       | 8 1           |
| 205 | 0 0 85   | + 11 2     | 455              | 0 00262  | - 7 5         |
| 210 | 906      | 11         | 460              | 27       | 6 8           |
| 215 | 961      | 11         | 465              | 195      | 6 1           |
| 220 | 1015     | 10 7       | 470              | 166      | 5 4           |
| 225 | 1 69     | 10 5       | 475              | 141      | 4 5           |
| 230 | 0 011 0  | + 10 1     | 480              | 0 00120  | - 3 7         |
| 235 | 1170     | 9 7        | 485              | 104      | 2 9           |
| 240 | 1 16     | 9 2        | 490              | 92       | 0             |
| 245 | 126      | 8 6        | 495              | 84       | 1 1           |
| 250 | 01303    | + 8 1      | 500              | 0 00081  | - 0 2         |

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|                |          | 3             |                  |          | 3             |
|----------------|----------|---------------|------------------|----------|---------------|
| G              | Equation | $\Delta_{rd}$ | G                | Equation | $\Delta_{rd}$ |
| <sup>d</sup> 0 | 00400    | + 5 4         | <sup>d</sup> 250 | 0 00 87  | - 5 2         |
| 5              | 4 7      | 5 4           | 255              | 261      | 5 1           |
| 10             | 454      | 5 4           | 260              | 237      | 4 9           |
| 15             | 48       | 5 3           | 265              | 1        | 4 8           |
| 20             | 5 7      | 5             | 270              | 189      | 4 6           |
| 25             | 533      | 5 1           | 275              | 167      | 4 4           |
| 30             | 0 0 558  | + 4 9         | 280              | 0 00146  | - 4 1         |
| 35             | 582      | 4 8           | 285              | 125      | 3 9           |
| 40             | 606      | 4 6           | 290              | 106      | 3 6           |
| 45             | 629      | 4 4           | 295              | 89       | 3 3           |
| 50             | 650      | 4 2           | 300              | 73       | 3 0           |
| 55             | 0 00670  | + 4           | 305              | 0 00059  | - 2 7         |
| 60             | 689      | 3 7           | 310              | 46       | 4             |
| 65             | 707      | 3 4           | 315              | 35       | 1             |
| 70             | 7 3      | 3 1           | 320              | 26       | 1 7           |
| 75             | 738      | 2 8           | 325              | 18       | 1 3           |
| 80             | 0 00751  | + 5           | 330              | 0 0013   | - 1 0         |
| 85             | 763      |               | 335              | 8        | 0 6           |
| 90             | 77       | 1 8           | 340              | 7        | - 0 3         |
| 95             | 781      | 1 4           | 345              | 6        | + 0 1         |
| 100            | 786      | 1 1           | 350              | 8        | 0 5           |
| 105            | 0 00791  | + 0 7         | 355              | 0 00011  | + 0 9         |
| 110            | 793      | + 0 4         | 360              | 16       | 1 2           |
| 115            | 794      | 0 0           | 365              | 3        | 1 6           |
| 120            | 793      | 0 4           | 370              | 3        | 0             |
| 125            | 790      | 0 8           | 375              | 43       | 3             |
| 130            | 0 00785  | - 1 1         | 380              | 0 00055  | + 6           |
| 135            | 778      | 1 5           | 385              | 69       | 2 9           |
| 140            | 770      | 1 8           | 390              | 84       | 3             |
| 145            | 759      | 2             | 395              | 101      | 3 6           |
| 150            | 748      | 2 5           | 400              | 120      | 3 8           |
| 155            | 0 0735   | - 9           | 405              | 0 00139  | + 4 0         |
| 160            | 720      | 3             | 410              | 160      | 4 3           |
| 165            | 7 3      | 3 5           | 415              | 182      | 4 5           |
| 170            | 685      | 3 8           | 420              | 205      | 4 7           |
| 175            | 666      | 4 0           | 425              | 2 9      | 4 9           |
| 180            | 0 00645  | - 4 2         | 430              | 0 00254  | + 5 0         |
| 185            | 624      | 4 5           | 435              | 79       | 5 2           |
| 190            | 600      | 4 7           | 440              | 305      | 5 3           |
| 195            | 577      | 4 8           | 445              | 332      | 5 4           |
| 200            | 552      | 5 0           | 450              | 359      | 5 4           |
| 205            | 0 00527  | - 5           | 455              | 0 00386  | + 5 4         |
| 210            | 5 1      | 5 3           | 460              | 413      | 5 4           |
| 215            | 475      | 5 3           | 465              | 440      | 5 4           |
| 220            | 448      | 5 4           | 470              | 466      | 5 3           |
| 225            | 421      | 5 4           | 475              | 493      | 5 3           |
| 230            | 0 00394  | - 5 4         | 480              | 0 00519  | + 5 2         |
| 235            | 366      | 5 4           | 485              | 545      | 5 0           |
| 240            | 340      | 5 4           | 490              | 569      | 4 9           |
| 245            | 313      | 5 3           | 495              | 593      | 4 7           |
| 250            | 0 00287  | - 5 2         | 500              | 0 00616  | + 4 5         |

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# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XIX

Equations of Longitude

XX

| 1   | 2        | 3             | 1   | 2        | 3             |
|-----|----------|---------------|-----|----------|---------------|
| H   | Equation | $\Delta_{rd}$ | H   | Equation | $\Delta_{rd}$ |
| d   | o        |               | d   | o        |               |
| 0   | 0°01000  | + 11,8        | 250 | 0°00896  | - 11,7        |
| 5   | 1059     | 11,8          | 255 | 837      | 11,6          |
| 10  | 1118     | 11,7          | 260 | 780      | 11,4          |
| 15  | 1176     | 11,6          | 265 | 723      | 11,2          |
| 20  | 1233     | 11,4          | 270 | 667      | 11,0          |
| 25  | 1290     | 11,2          | 275 | 613      | 10,7          |
| 30  | 0°01346  | + 10,9        | 280 | 0°00561  | - 10,3        |
| 35  | 1399     | 10,6          | 285 | 510      | 9,9           |
| 40  | 1451     | 10,2          | 290 | 462      | 9,5           |
| 45  | 1502     | 9,8           | 295 | 416      | 9,0           |
| 50  | 1549     | 9,4           | 300 | 372      | 8,5           |
| 55  | 0°01595  | + 8,9         | 305 | 0°00331  | - 8,0         |
| 60  | 1638     | 8,4           | 310 | 292      | 7,3           |
| 65  | 1678     | 7,8           | 315 | 257      | 6,7           |
| 70  | 1716     | 7,2           | 320 | 225      | 6,1           |
| 75  | 1751     | 6,6           | 325 | 196      | 5,4           |
| 80  | 0°01782  | + 5,9         | 330 | 0°00171  | - 4,8         |
| 85  | 1810     | 5,3           | 335 | 149      | 4,0           |
| 90  | 1835     | 4,6           | 340 | 130      | 3,3           |
| 95  | 1856     | 3,9           | 345 | 115      | 2,6           |
| 100 | 1873     | 3,1           | 350 | 105      | 1,8           |
| 105 | 0°01887  | + 2,4         | 355 | 0°00098  | - 1,0         |
| 110 | 1897     | 1,6           | 360 | 95       | - 0,3         |
| 115 | 1903     | 0,9           | 365 | 95       | + 0,5         |
| 120 | 1906     | + 0,1         | 370 | 100      | 1,3           |
| 125 | 1904     | - 0,7         | 375 | 108      | 2,0           |
| 130 | 0°01899  | - 1,4         | 380 | 0°00120  | + 2,8         |
| 135 | 1890     | 2,2           | 385 | 136      | 3,5           |
| 140 | 1877     | 2,9           | 390 | 155      | 4,2           |
| 145 | 1861     | 3,7           | 395 | 178      | 5,0           |
| 150 | 1840     | 4,4           | 400 | 204      | 5,6           |
| 155 | 0°01816  | - 5,1         | 405 | 0°00234  | + 6,3         |
| 160 | 1789     | 5,8           | 410 | 268      | 6,9           |
| 165 | 1759     | 6,5           | 415 | 303      | 7,5           |
| 170 | 1724     | 7,1           | 420 | 343      | 8,1           |
| 175 | 1688     | 7,7           | 425 | 385      | 8,6           |
| 180 | 0°01648  | - 8,2         | 430 | 0°00430  | + 9,2         |
| 185 | 1605     | 8,8           | 435 | 476      | 9,6           |
| 190 | 1560     | 9,3           | 440 | 526      | 10,0          |
| 195 | 1513     | 9,7           | 445 | 577      | 10,4          |
| 200 | 1463     | 10,1          | 450 | 630      | 10,8          |
| 205 | 0°01411  | - 10,5        | 455 | 0°00685  | + 11,1        |
| 210 | 1358     | 10,8          | 460 | 741      | 11,3          |
| 215 | 1303     | 11,1          | 465 | 797      | 11,5          |
| 220 | 1246     | 11,3          | 470 | 855      | 11,6          |
| 225 | 1190     | 11,5          | 475 | 914      | 11,7          |
| 230 | 0°01131  | - 11,7        | 480 | 0°00973  | + 11,8        |
| 235 | 1073     | 11,8          | 485 | 1032     | 11,8          |
| 240 | 1014     | 11,8          | 490 | 1091     | 11,7          |
| 245 | 954      | 11,8          | 495 | 1150     | 11,6          |
| 250 | 0°00896  | - 11,7        | 500 | 0°01207  | + 11,5        |

Added Constant : 0°01000.

| 1   | 2        | 3             | 1   | 2        | 3             |
|-----|----------|---------------|-----|----------|---------------|
| I   | Equation | $\Delta_{rd}$ | I   | Equation | $\Delta_{rd}$ |
| d   | o        |               | d   | o        |               |
| 0   | 0°00400  | + 4,6         | 250 | 0°00367  | - 4,6         |
| 5   | 423      | 4,6           | 255 | 344      | 4,5           |
| 10  | 446      | 4,6           | 260 | 322      | 4,5           |
| 15  | 469      | 4,5           | 265 | 299      | 4,4           |
| 20  | 491      | 4,4           | 270 | 278      | 4,4           |
| 25  | 513      | 4,4           | 275 | 257      | 4,2           |
| 30  | 0°00534  | + 4,2         | 280 | 0°00236  | - 4,1         |
| 35  | 555      | 4,1           | 285 | 216      | 3,9           |
| 40  | 575      | 4,0           | 290 | 197      | 3,8           |
| 45  | 595      | 3,8           | 295 | 178      | 3,6           |
| 50  | 613      | 3,6           | 300 | 161      | 3,4           |
| 55  | 0°00632  | + 3,5         | 305 | 0°00145  | - 3,2         |
| 60  | 648      | 3,3           | 310 | 130      | 3,0           |
| 65  | 664      | 3,1           | 315 | 115      | 2,7           |
| 70  | 679      | 2,8           | 320 | 102      | 2,5           |
| 75  | 693      | 2,6           | 325 | 90       | 2,2           |
| 80  | 0°00704  | + 2,3         | 330 | 0°00080  | - 2,0         |
| 85  | 716      | 2,1           | 335 | 71       | 1,7           |
| 90  | 725      | 1,8           | 340 | 63       | 1,4           |
| 95  | 734      | 1,5           | 345 | 57       | 1,1           |
| 100 | 741      | 1,3           | 350 | 52       | 0,8           |
| 105 | 0°00746  | + 1,0         | 355 | 0°00048  | - 0,6         |
| 110 | 750      | 0,7           | 360 | 46       | - 0,3         |
| 115 | 753      | 0,4           | 365 | 46       | 0,0           |
| 120 | 754      | + 0,1         | 370 | 47       | + 0,3         |
| 125 | 754      | - 0,2         | 375 | 49       | 0,6           |
| 130 | 0°00752  | - 0,5         | 380 | 0°00053  | + 0,9         |
| 135 | 749      | 0,8           | 385 | 58       | 1,2           |
| 140 | 744      | 1,1           | 390 | 65       | 1,5           |
| 145 | 738      | 1,4           | 395 | 74       | 1,8           |
| 150 | 730      | 1,7           | 400 | 83       | 2,0           |
| 155 | 0°00721  | - 1,9         | 405 | 0°00094  | + 2,3         |
| 160 | 711      | 2,2           | 410 | 106      | 2,6           |
| 165 | 700      | 2,5           | 415 | 119      | 2,8           |
| 170 | 686      | 2,7           | 420 | 134      | 3,0           |
| 175 | 672      | 2,9           | 425 | 150      | 3,3           |
| 180 | 0°00657  | - 3,2         | 430 | 0°00166  | + 3,4         |
| 185 | 641      | 3,4           | 435 | 184      | 3,6           |
| 190 | 623      | 3,5           | 440 | 203      | 3,8           |
| 195 | 606      | 3,7           | 445 | 223      | 4,0           |
| 200 | 586      | 3,9           | 450 | 243      | 4,1           |
| 205 | 0°00566  | - 4,1         | 455 | 0°00264  | + 4,2         |
| 210 | 546      | 4,2           | 460 | 285      | 4,3           |
| 215 | 525      | 4,3           | 465 | 307      | 4,4           |
| 220 | 503      | 4,4           | 470 | 329      | 4,5           |
| 225 | 481      | 4,5           | 475 | 351      | 4,6           |
| 230 | 0°00458  | - 4,5         | 480 | 0°00374  | + 4,6         |
| 235 | 436      | 4,6           | 485 | 397      | 4,6           |
| 240 | 413      | 4,6           | 490 | 420      | 4,6           |
| 245 | 389      | 4,6           | 495 | 443      | 4,6           |
| 250 | 0°00367  | - 4,6         | 500 | 0°00466  | + 4,5         |

Added Constant : 0°00400.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXI

Equation of Longitude

Argument J

| J      | Equation | $\Delta$<br>o | J      | Equation | $\Delta$<br>o | J      | Equation | $\Delta$<br>o | J      | Equation | $\Delta$<br>o |
|--------|----------|---------------|--------|----------|---------------|--------|----------|---------------|--------|----------|---------------|
| 1850 0 | 00576    | - 1 8         | 1860 0 | 00304    | - 1 5         | 1870 0 | 00488    | - 3 3         | 1880 0 | 00614    | - 9 8         |
| 2      | 576      | + 1 8         | 2      | 303      | + 8           | 2      | 480      | 4 5           | 2      | 594      | 9 5           |
| 4      | 583      | 4 3           | 4      | 3 7      | 2 5           | 4      | 470      | 5 0           | 4      | 577      | 8 5           |
| 6      | 593      | 4 8           | 6      | 313      | 4 5           | 6      | 460      | 6 0           | 6      | 560      | 7 3           |
| 8      | 60       | 5 3           | 8      | 3 5      | 6 3           | 8      | 446      | 7 8           | 8      | 548      | 5 8           |
| 1851 0 | 000614   | + 6 0         | 1861 0 | 00338    | + 7 5         | 1871 0 | 0004 9   | 8 8           | 1881 0 | 000537   | 5 3           |
| 2      | 626      | 6 3           | 2      | 355      | 9 5           | 2      | 411      | 8 8           | 2      | 527      | 4 0           |
| 4      | 639      | 7 3           | 4      | 376      | 10 3          | 4      | 394      | 8 3           | 4      | 5 1      | 3 8           |
| 6      | 655      | 8 5           | 6      | 396      | 10 5          | 6      | 378      | 8 3           | 6      | 507      | 3 0           |
| 8      | 673      | 8 8           | 8      | 418      | 12 0          | 8      | 361      | 8 8           | 8      | 509      | 1             |
| 1852 0 | 0 690    | + 8 5         | 1862 0 | 000444   | +13 5         | 1872 0 | 000343   | - 8 8         | 1882 0 | 000508   | - 0 8         |
| 2      | 707      | 8 0           | 2      | 47       | 13 5          | 2      | 3 6      | 7 3           | 2      | 506      | 0 8           |
| 4      | 7        | 7 8           | 4      | 498      | 1 8           | 4      | 314      | 5 3           | 4      | 505      | + 3           |
| 6      | 738      | 7 3           | 6      | 523      | 12 3          | 6      | 305      | 3 5           | 6      | 507      | 0 8           |
| 8      | 751      | 6 3           | 8      | 547      | 1             | 8      | 300      | - 1 5         | 8      | 508      | 0 8           |
| 1853 0 | 0 763    | + 6 3         | 1863 0 | 00 571   | +10 8         | 1873 0 | 000299   | + 0 3         | 1883 0 | 000510   | + 1 3         |
| 2      | 776      | 5 3           | 2      | 590      | 9 0           | 2      | 3 1      | 8             | 2      | 513      | 2 0           |
| 4      | 784      | 4 0           | 4      | 607      | 7 8           | 4      | 310      | 5 8           | 4      | 518      | 2 5           |
| 6      | 79       | 4             | 6      | 6 1      | 6 3           | 6      | 3 4      | 8             | 6      | 523      | 2             |
| 8      | 800      | + 3           | 8      | 63       | 4 8           | 8      | 342      | 9 5           | 8      | 5 6      | 2 8           |
| 1854 0 | 0 801    | 0 0           | 1864 0 | 000640   | + 3 8         | 1874 0 | 00 362   | +11 3         | 1884 0 | 000534   | + 4 5         |
| 2      | 800      | - 0 3         | 2      | 647      | + 1 3         | 2      | 387      | 12 8          | 2      | 544      | 4 8           |
| 4      | 800      | 1 0           | 4      | 645      | - 1 3         | 4      | 413      | 14 3          | 4      | 553      | 4 0           |
| 6      | 796      | 8             | 6      | 642      | 3 8           | 6      | 44       | 15 3          | 6      | 560      | 4 3           |
| 8      | 789      | 3 3           | 8      | 634      | 4 5           | 8      | 475      | 17 3          | 8      | 570      | 5 8           |
| 1855 0 | 783      | - 3 8         | 1865 0 | 006 4    | - 5 8         | 1875 0 | 000511   | +18 0         | 1885 0 | 000583   | + 6 0         |
| 2      | 774      | 5 0           | 2      | 611      | 7             | 2      | 546      | 17 5          | 2      | 594      | 6 0           |
| 4      | 763      | 6 3           | 4      | 596      | 7 3           | 4      | 581      | 18 0          | 4      | 607      | 6             |
| 6      | 749      | 7 3           | 6      | 58       | 7             | 6      | 618      | 17 8          | 6      | 618      | 5 3           |
| 8      | 734      | 8 3           | 8      | 568      | 8 0           | 8      | 65       | 17            | 8      | 628      | 5 8           |
| 1856 0 | 000716   | 9 5           | 1866 0 | 00055    | - 8 8         | 1876 0 | 000686   | +15 8         | 1886 0 | 000641   | + 7 3         |
| 2      | 696      | 10 5          | 2      | 533      | 7 8           | 2      | 715      | 14 3          | 2      | 657      | 8 0           |
| 4      | 674      | 11 3          | 4      | 519      | 6 3           | 4      | 743      | 12 5          | 4      | 673      | 7 0           |
| 6      | 651      | 11 5          | 6      | 508      | 5 8           | 6      | 765      | 9 5           | 6      | 685      | 5 8           |
| 8      | 6 8      | 1 5           | 8      | 496      | 5 8           | 8      | 781      | 7 3           | 8      | 696      | 5 3           |
| 1857 0 | 000605   | -12 3         | 1867 0 | 0485     | - 4 5         | 1877 0 | 000794   | + 5 8         | 1887 0 | 00 706   | + 5 3         |
| 2      | 579      | 13            | 2      | 478      | 2 8           | 2      | 8 4      | 3 5           | 2      | 717      | 5 0           |
| 4      | 553      | 1 8           | 4      | 474      | 1 5           | 4      | 808      | + 1 5         | 4      | 7 6      | 4 0           |
| 6      | 5 8      | 1 0           | 6      | 47       | - 0 5         | 6      | 81       | - 8           | 6      | 733      | 3 0           |
| 8      | 505      | 1             | 8      | 47       | 0             | 8      | 805      | 3 5           | 8      | 738      | 3 5           |
| 1858 0 | 000480   | -13 0         | 1868 0 | 00047    | + 0 5         | 1878 0 | 0 0796   | - 5 3         | 1888 0 | 000747   | + 4 3         |
| 2      | 453      | 1 8           | 2      | 474      | 1 8           | 2      | 784      | 7             | 2      | 755      | 3 0           |
| 4      | 4 9      | 11 5          | 4      | 479      | 3             | 4      | 768      | 7 8           | 4      | 759      | 1 8           |
| 6      | 4 7      | 11 3          | 6      | 483      |               | 6      | 753      | 8 0           | 6      | 76       | 1 5           |
| 8      | 384      | 11 0          | 8      | 487      | 0             | 8      | 736      | 9 5           | 8      | 765      | 1 0           |
| 1859 0 | 0 0363   | - 9 8         | 1869 0 | 000491   | + 1 8         | 1879 0 | 000715   | -10 3         | 1889 0 | 000766   | + 0 8         |
| 2      | 345      | 8 0           | 2      | 494      | + 1 0         | 2      | 695      | 10 0          | 2      | 768      | 1 0           |
| 4      | 331      | 6 3           | 4      | 495      | 0 0           | 4      | 675      | 10 5          | 4      | 770      | 1 0           |
| 6      | 320      | 5 5           | 6      | 494      | - 5           | 6      | 653      | 10 5          | 6      | 772      | 1 0           |
| 8      | 309      | 4 0           | 8      | 493      | 1 5           | 8      | 633      | 9 8           | 8      | 774      | 0 8           |
| 1860 0 | 000304   | - 1 5         | 1870 0 | 000488   | - 3 3         | 1880 0 | 000614   | - 9 8         | 1890 0 | 000775   | + 0 3         |

Add d C t t 006

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXI continued

Equation of Longitude

Argument J

| 1                 | 2                    | 3                             | 1                 | 2                    | 3                             | 1                 | 2                    | 3                             | 1                 | 2                    | 3                             |
|-------------------|----------------------|-------------------------------|-------------------|----------------------|-------------------------------|-------------------|----------------------|-------------------------------|-------------------|----------------------|-------------------------------|
| J                 | Equation             | $\Delta$<br>0 <sup>o</sup> .1 | J                 | Equation             | $\Delta$<br>0 <sup>o</sup> .1 | J                 | Equation             | $\Delta$<br>0 <sup>o</sup> .1 | J                 | Equation             | $\Delta$<br>0 <sup>o</sup> .1 |
| 1890 <sup>o</sup> | 0 <sup>o</sup> 00775 | + 0,3                         | 1900 <sup>o</sup> | 0 <sup>o</sup> 00818 | + 3,5                         | 1910 <sup>o</sup> | 0 <sup>o</sup> 00485 | + 7,8                         | 1920 <sup>o</sup> | 0 <sup>o</sup> 00545 | + 8,8                         |
| 2                 | 775                  | 0,0                           | 2                 | 823                  | + 1,3                         | 2                 | 502                  | 9,0                           | 2                 | 565                  | 10,3                          |
| 4                 | 775                  | + 0,3                         | 4                 | 823                  | - 1,3                         | 4                 | 521                  | 10,5                          | 4                 | 586                  | 10,5                          |
| 6                 | 776                  | 0,0                           | 6                 | 818                  | 3,5                           | 6                 | 544                  | 12,0                          | 6                 | 607                  | 11,3                          |
| 8                 | 775                  | - 1,0                         | 8                 | 809                  | 6,0                           | 8                 | 569                  | 13,3                          | 8                 | 631                  | 13,5                          |
| 1891 <sup>o</sup> | 0 <sup>o</sup> 00772 | - 0,5                         | 1901 <sup>o</sup> | 0 <sup>o</sup> 00794 | - 7,8                         | 1911 <sup>o</sup> | 0 <sup>o</sup> 00597 | + 13,8                        | 1921 <sup>o</sup> | 0 <sup>o</sup> 00661 | + 15,3                        |
| 2                 | 773                  | 0,3                           | 2                 | 778                  | 9,0                           | 2                 | 624                  | 12,8                          | 2                 | 692                  | 14,8                          |
| 4                 | 771                  | 1,0                           | 4                 | 758                  | 10,3                          | 4                 | 648                  | 12,0                          | 4                 | 720                  | 12,8                          |
| 6                 | 769                  | 1,8                           | 6                 | 737                  | 10,8                          | 6                 | 672                  | 12,0                          | 6                 | 743                  | 11,3                          |
| 8                 | 764                  | 2,8                           | 8                 | 715                  | 11,5                          | 8                 | 696                  | 11,8                          | 8                 | 765                  | 11,3                          |
| 1892 <sup>o</sup> | 0 <sup>o</sup> 00758 | - 3,5                         | 1902 <sup>o</sup> | 0 <sup>o</sup> 00691 | - 12,0                        | 1912 <sup>o</sup> | 0 <sup>o</sup> 00719 | + 11,0                        | 1922 <sup>o</sup> | 0 <sup>o</sup> 00788 | + 11,0                        |
| 2                 | 750                  | 4,0                           | 2                 | 667                  | 12,0                          | 2                 | 740                  | 9,8                           | 2                 | 809                  | 10,0                          |
| 4                 | 742                  | 4,8                           | 4                 | 643                  | 11,0                          | 4                 | 758                  | 9,0                           | 4                 | 828                  | 9,5                           |
| 6                 | 731                  | 6,3                           | 6                 | 623                  | 10,0                          | 6                 | 776                  | 8,3                           | 6                 | 847                  | 9,5                           |
| 8                 | 717                  | 7,5                           | 8                 | 603                  | 9,8                           | 8                 | 791                  | 7,3                           | 8                 | 866                  | 8,5                           |
| 1893 <sup>o</sup> | 0 <sup>o</sup> 00701 | - 8,8                         | 1903 <sup>o</sup> | 0 <sup>o</sup> 00584 | - 8,8                         | 1913 <sup>o</sup> | 0 <sup>o</sup> 00805 | + 6,0                         | 1923 <sup>o</sup> | 0 <sup>o</sup> 00881 | + 6,3                         |
| 2                 | 682                  | 9,8                           | 2                 | 568                  | 7,3                           | 2                 | 815                  | 3,5                           | 2                 | 891                  | 3,8                           |
| 4                 | 662                  | 10,3                          | 4                 | 555                  | 6,0                           | 4                 | 819                  | 1,8                           | 4                 | 896                  | 2,5                           |
| 6                 | 641                  | 11,0                          | 6                 | 544                  | 4,5                           | 6                 | 822                  | + 0,5                         | 6                 | 901                  | + 1,5                         |
| 8                 | 618                  | 12,3                          | 8                 | 537                  | 3,5                           | 8                 | 821                  | - 1,5                         | 8                 | 902                  | - 0,3                         |
| 1894 <sup>o</sup> | 0 <sup>o</sup> 00592 | - 13,5                        | 1904 <sup>o</sup> | 0 <sup>o</sup> 00530 | - 1,8                         | 1914 <sup>o</sup> | 0 <sup>o</sup> 00816 | - 2,8                         | 1924 <sup>o</sup> | 0 <sup>o</sup> 00900 | - 1,8                         |
| 2                 | 564                  | 13,0                          | 2                 | 529                  | 0,5                           | 2                 | 810                  | 3,8                           | 2                 | 895                  | 2,5                           |
| 4                 | 538                  | 13,5                          | 4                 | 528                  | - 0,3                         | 4                 | 801                  | 4,8                           | 4                 | 890                  | 3,0                           |
| 6                 | 512                  | 13,0                          | 6                 | 528                  | + 0,3                         | 6                 | 791                  | 5,3                           | 6                 | 883                  | 4,3                           |
| 8                 | 488                  | 12,5                          | 8                 | 529                  | 1,3                           | 8                 | 780                  | 5,8                           | 8                 | 873                  | 4,8                           |
| 1895 <sup>o</sup> | 0 <sup>o</sup> 00463 | - 12,3                        | 1905 <sup>o</sup> | 0 <sup>o</sup> 00533 | + 1,5                         | 1915 <sup>o</sup> | 0 <sup>o</sup> 00768 | - 6,8                         | 1925 <sup>o</sup> | 0 <sup>o</sup> 00864 | - 4,3                         |
| 2                 | 441                  | 10,5                          | 2                 | 535                  | 0,8                           | 2                 | 753                  | 8,3                           | 2                 | 856                  | 4,5                           |
| 4                 | 421                  | 9,0                           | 4                 | 536                  | 0,5                           | 4                 | 735                  | 8,5                           | 4                 | 846                  | 4,3                           |
| 6                 | 405                  | 6,8                           | 6                 | 537                  | 0,5                           | 6                 | 719                  | 8,0                           | 6                 | 839                  | 3,3                           |
| 8                 | 394                  | 4,3                           | 8                 | 538                  | + 0,5                         | 8                 | 703                  | 9,0                           | 8                 | 833                  | 3,0                           |
| 1896 <sup>o</sup> | 0 <sup>o</sup> 00388 | - 1,8                         | 1906 <sup>o</sup> | 0 <sup>o</sup> 00539 | - 0,3                         | 1916 <sup>o</sup> | 0 <sup>o</sup> 00683 | - 9,3                         | 1926 <sup>o</sup> | 0 <sup>o</sup> 00827 | - 2,0                         |
| 2                 | 387                  | + 0,5                         | 2                 | 537                  | 1,5                           | 2                 | 664                  | 9,5                           | 2                 | 825                  | 1,5                           |
| 4                 | 390                  | 3,0                           | 4                 | 533                  | 2,8                           | 4                 | 645                  | 9,3                           | 4                 | 821                  | 1,8                           |
| 6                 | 399                  | 5,0                           | 6                 | 526                  | 3,5                           | 6                 | 627                  | 8,8                           | 6                 | 818                  | 0,8                           |
| 8                 | 410                  | 7,0                           | 8                 | 519                  | 3,8                           | 8                 | 610                  | 8,8                           | 8                 | 818                  | - 0,3                         |
| 1897 <sup>o</sup> | 0 <sup>o</sup> 00427 | + 9,8                         | 1907 <sup>o</sup> | 0 <sup>o</sup> 00511 | - 4,3                         | 1917 <sup>o</sup> | 0 <sup>o</sup> 00592 | - 9,3                         | 1927 <sup>o</sup> | 0 <sup>o</sup> 00817 | + 0,5                         |
| 2                 | 449                  | 11,8                          | 2                 | 502                  | 5,3                           | 2                 | 573                  | 8,5                           | 2                 | 820                  | 1,5                           |
| 4                 | 474                  | 13,3                          | 4                 | 490                  | 6,0                           | 4                 | 558                  | 7,5                           | 4                 | 823                  | 1,8                           |
| 6                 | 502                  | 14,0                          | 6                 | 478                  | 5,8                           | 6                 | 543                  | 6,5                           | 6                 | 827                  | 1,8                           |
| 8                 | 530                  | 15,0                          | 8                 | 467                  | 4,8                           | 8                 | 532                  | 6,0                           | 8                 | 830                  | 1,3                           |
| 1898 <sup>o</sup> | 0 <sup>o</sup> 00562 | + 16,5                        | 1908 <sup>o</sup> | 0 <sup>o</sup> 00459 | - 4,3                         | 1918 <sup>o</sup> | 0 <sup>o</sup> 00519 | - 5,8                         | 1928 <sup>o</sup> | 0 <sup>o</sup> 00832 | + 1,0                         |
| 2                 | 596                  | 16,8                          | 2                 | 450                  | 3,3                           | 2                 | 509                  | 3,8                           | 2                 | 834                  | + 0,5                         |
| 4                 | 629                  | 16,3                          | 4                 | 446                  | 1,8                           | 4                 | 504                  | 2,5                           | 4                 | 834                  | - 0,5                         |
| 6                 | 661                  | 15,8                          | 6                 | 443                  | 1,0                           | 6                 | 499                  | 1,8                           | 6                 | 832                  | 1,8                           |
| 8                 | 692                  | 15,5                          | 8                 | 442                  | 0,8                           | 8                 | 497                  | - 0,3                         | 8                 | 827                  | 3,3                           |
| 1899 <sup>o</sup> | 0 <sup>o</sup> 00723 | + 15,0                        | 1909 <sup>o</sup> | 0 <sup>o</sup> 00440 | - 0,8                         | 1919 <sup>o</sup> | 0 <sup>o</sup> 00498 | + 1,3                         | 1929 <sup>o</sup> | 0 <sup>o</sup> 00819 | - 5,0                         |
| 2                 | 752                  | 13,5                          | 2                 | 439                  | + 0,8                         | 2                 | 502                  | 2,3                           | 2                 | 807                  | 6,5                           |
| 4                 | 777                  | 11,0                          | 4                 | 443                  | 4,3                           | 4                 | 507                  | 4,0                           | 4                 | 793                  | 7,5                           |
| 6                 | 796                  | 8,0                           | 6                 | 456                  | 7,0                           | 6                 | 518                  | 5,8                           | 6                 | 777                  | 8,3                           |
| 8                 | 809                  | 5,0                           | 8                 | 471                  | 7,3                           | 8                 | 530                  | 6,8                           | 8                 | 760                  | 8,8                           |
| 1900 <sup>o</sup> | 0 <sup>o</sup> 00818 | + 3,5                         | 1910 <sup>o</sup> | 0 <sup>o</sup> 00485 | + 7,8                         | 1920 <sup>o</sup> | 0 <sup>o</sup> 00545 | + 8,8                         | 1930 <sup>o</sup> | 0 <sup>o</sup> 00742 | - 10,3                        |

Added Constant : 0<sup>o</sup>00600.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXI continued

Equation of Longitude

Argument J

| J      | Equation | $\Delta$ | J      | Equation | $\Delta$ | J      | Equation | $\Delta$ | J      | Equation | $\Delta$ |
|--------|----------|----------|--------|----------|----------|--------|----------|----------|--------|----------|----------|
| 1930 0 | 074      | -1 3     | 1940 0 | 00568    | -8 3     | 1950 0 | 0 00715  | +0 5     | 1960 0 | 0 00911  | -4 3     |
| 2      | 719      | 11 5     | 2      | 553      | 6 5      | 2      | 715      | 0 0      | 2      | 899      | 5 5      |
| 4      | 696      | 11 5     | 4      | 54       | 5 0      | 4      | 715      | -0 3     | 4      | 889      | 6 5      |
| 6      | 673      | 1 3      | 6      | 533      | 4 3      | 6      | 714      | 1 8      | 6      | 873      | 8 5      |
| 8      | 647      | 1 8      | 8      | 5 5      | 3 3      | 8      | 7 8      | 2 5      | 8      | 855      | 9 3      |
| 1931 0 | 0 006    | -1 3     | 1941 0 | 0 005 0  | -2 3     | 1951 0 | 0 07 4   | -8       | 1961 0 | 0 00836  | -9 3     |
| 2      | 598      | 11 0     | 2      | 516      | 2 5      | 2      | 697      | 3 8      | 2      | 818      | 9 5      |
| 4      | 578      | 9        | 4      | 510      | 2 5      | 4      | 689      | 5        | 4      | 798      | 9 5      |
| 6      | 56       | 7        | 6      | 506      | 1 5      | 6      | 677      | 5 5      | 6      | 78       | 8 3      |
| 8      | 550      | 5 3      | 8      | 5 4      | 0 8      | 8      | 667      | 6 3      | 8      | 765      | 7 5      |
| 1932 0 | 00541    | -3 8     | 1942 0 | 0 00503  | -0 3     | 1952 0 | 0 0065   | -8 0     | 1962 0 | 0 0075   | -6 8     |
| 2      | 535      | -0       | 2      | 503      | 0 5      | 2      | 635      | 8 5      | 2      | 738      | 5 0      |
| 4      | 533      | +8       | 4      | 5 1      | 1 0      | 4      | 618      | 9 0      | 4      | 73       | 4 3      |
| 6      | 538      | 3 5      | 6      | 499      | 0 8      | 6      | 599      | 9 0      | 6      | 7 1      | 3 3      |
| 8      | 547      | 6 5      | 8      | 498      | 1 0      | 8      | 58       | 9 5      | 8      | 717      |          |
| 1933 0 | 0 00564  | +9 5     | 1943 0 | 0 0 495  | -0 8     | 1953 0 | 0 00561  | -10 5    | 1963 0 | 00715    | 1 0      |
| 2      | 585      | 11 0     | 2      | 495      | 0        | 2      | 540      | 10 3     | 2      | 713      | -0 5     |
| 4      | 508      | 11 8     | 4      | 495      | -0 5     | 4      | 520      | 10 0     | 4      | 713      | +0 5     |
| 6      | 63       | 13       | 6      | 493      | -0 3     | 6      | 500      | 9 8      | 6      | 715      | 1 3      |
| 8      | 660      | 14 5     | 8      | 494      | +0 5     | 8      | 481      | 9 5      | 8      | 718      | 0        |
| 1934 0 | 0 00690  | +16 0    | 1944 0 | 0 0 495  | +1 0     | 1954 0 | 0 00462  | -9 3     | 1964 0 | 0 007 3  | +2       |
| 2      | 7 4      | 16 5     | 2      | 497      | 1 5      | 2      | 444      | 8 3      | 2      | 726      | 1 8      |
| 4      | 756      | 15 5     | 4      | 501      | 1 8      | 4      | 429      | 6 3      | 4      | 730      | 1 3      |
| 6      | 786      | 15 5     | 6      | 5 4      | 1 8      | 6      | 419      | 4 3      | 6      | 731      | +0 5     |
| 8      | 818      | 15 3     | 8      | 5 8      | 2 3      | 8      | 41       | 2 8      | 8      | 732      | 0        |
| 1935 0 | 847      | +14 5    | 1945 0 | 0 00513  | +3 0     | 1955 0 | 0 00408  | -0 3     | 1965 0 | 0 00731  | -0 8     |
| 2      | 876      | 1 8      | 2      | 520      | 4 3      | 2      | 411      | +2 3     | 2      | 7 9      | 1 5      |
| 4      | 898      | 9 8      | 4      | 530      | 4 3      | 4      | 417      | 4 0      | 4      | 725      | 2 5      |
| 6      | 915      | 8 3      | 6      | 537      | 4 3      | 6      | 427      | 5 5      | 6      | 719      | 4        |
| 8      | 931      | 6 3      | 8      | 547      | 5 8      | 8      | 439      | 7 8      | 8      | 709      | 5 8      |
| 1936 0 | 0 00940  | +3 5     | 1946 0 | 0 00560  | +6 5     | 1956 0 | 0 00458  | +10 3    | 1966 0 | 0 00696  | -7 5     |
| 2      | 945      | +1 3     | 2      | 573      | 5 5      | 2      | 480      | 12 5     | 2      | 679      | 8 8      |
| 4      | 945      | -1 0     | 4      | 58       | 4 8      | 4      | 508      | 14 0     | 4      | 661      | 9 3      |
| 6      | 941      | 3 3      | 6      | 59       | 5 3      | 6      | 536      | 14 5     | 6      | 642      | 10 0     |
| 8      | 93       | 5 8      | 8      | 603      | 5 5      | 8      | 566      | 17 0     | 8      | 621      | 10 0     |
| 1937 0 | 00918    | -8 3     | 1947 0 | 0 00614  | +5 8     | 1957 0 | 0 00604  | +19 0    | 1967 0 | 0 00602  | -9 8     |
| 2      | 899      | 1 3      | 2      | 6 6      | 5 8      | 2      | 64       | 18 5     | 2      | 58       | 9 0      |
| 4      | 877      | 11 5     | 4      | 637      | 5 0      | 4      | 678      | 17 3     | 4      | 566      | 7 3      |
| 6      | 853      | 11 8     | 6      | 646      | 5 0      | 6      | 711      | 17       | 6      | 553      | 5 8      |
| 8      | 830      | 12 8     | 8      | 657      | 5 3      | 8      | 746      | 17 0     | 8      | 543      | 4 0      |
| 1938 0 | 0 00802  | -13 8    | 1948 0 | 0 00667  | +5 3     | 1958 0 | 0 00779  | +16 8    | 1968 0 | 00537    | -2 5     |
| 2      | 775      | 14 0     | 2      | 678      | 4 8      | 2      | 813      | 15 3     | 2      | 532      | -1 8     |
| 4      | 746      | 14 0     | 4      | 686      | 3 3      | 4      | 840      | 12 3     | 4      | 530      | 0 0      |
| 6      | 719      | 13 0     | 6      | 691      | 3 0      | 6      | 86       | 10 3     | 6      | 533      | +2 5     |
| 8      | 694      | 1 8      | 8      | 698      | 3 3      | 8      | 881      | 8 3      | 8      | 540      | 4 5      |
| 1939 0 | 0 00668  | -12 8    | 1949 0 | 0 00704  | +2 3     | 1959 0 | 0 00895  | +6 5     | 1969 0 | 0 00551  | +5 5     |
| 2      | 643      | 11 8     | 2      | 7 7      | 0        | 2      | 9 7      | 4 3      | 2      | 562      | 7 0      |
| 4      | 6 1      | 1 3      | 4      | 712      | 0        | 4      | 912      | 2 3      | 4      | 579      | 9 8      |
| 6      | 602      | 8 8      | 6      | 715      | +0 3     | 6      | 916      | +1 0     | 6      | 601      | 10 5     |
| 8      | 586      | 8 5      | 8      | 713      | 0        | 8      | 916      | -1 3     | 8      | 621      | 10 3     |
| 1940 0 | 0 00568  | -8 3     | 1950 0 | 0 00715  | +0 5     | 1960 0 | 0 00911  | -4 3     | 1970 0 | 0 00642  | +11 3    |

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXI *continued*

Equation of Longitude

Argument J

| 1      | 2        | 3                | 1      | 2        | 3                | 1      | 2        | 3                |
|--------|----------|------------------|--------|----------|------------------|--------|----------|------------------|
| J      | Equation | $\Delta$<br>0°:1 | J      | Equation | $\Delta$<br>0°:1 | J      | Equation | $\Delta$<br>0°:1 |
| 1970°0 | 0°00642  | + 11,3           | 1980°0 | 0°00382  | + 7,8            | 1990°0 | 0°00344  | - 10,8           |
| °2     | 666      | 12,3             | °2     | 398      | 7,8              | °2     | 322      | 9,5              |
| °4     | 691      | 12,3             | °4     | 413      | 7,8              | °4     | 306      | 7,3              |
| °6     | 715      | 12,3             | °6     | 429      | 7,5              | °6     | 293      | 5,8              |
| °8     | 740      | 12,0             | °8     | 443      | 8,0              | °8     | 283      | 4,5              |
| 1971°0 | 0°00763  | + 10,8           | 1981°0 | 0°00461  | + 9,0            | 1991°0 | 0°00275  | - 2,5            |
| °2     | 783      | 9,3              | °2     | 479      | 8,0              | °2     | 273      | 0,0              |
| °4     | 800      | 7,8              | °4     | 493      | 6,8              | °4     | 275      | + 2,3            |
| °6     | 814      | 6,0              | °6     | 506      | 6,5              | °6     | 282      | 4,5              |
| °8     | 824      | 4,8              | °8     | 519      | 5,8              | °8     | 293      | 7,5              |
| 1972°0 | 0°00833  | + 3,8            | 1982°0 | 0°00529  | + 4,8            | 1992°0 | 0°00312  | + 11,0           |
| °2     | 839      | + 2,0            | °2     | 538      | 3,5              | °2     | 337      | 13,3             |
| °4     | 841      | 0,0              | °4     | 543      | 2,3              | °4     | 365      | 14,5             |
| °6     | 839      | - 2,8            | °6     | 547      | 2,0              | °6     | 395      | 15,5             |
| °8     | 830      | 4,5              | °8     | 551      | 1,8              | °8     | 427      | 16,8             |
| 1973°0 | 0°00821  | - 5,3            | 1983°0 | 0°00554  | + 1,3            | 1993°0 | 0°00462  | + 19,0           |
| °2     | 809      | 7,5              | °2     | 556      | - 0,5            | °2     | 503      | 20,3             |
| °4     | 791      | 9,3              | °4     | 552      | 2,3              | °4     | 543      | 19,5             |
| °6     | 772      | 10,0             | °6     | 547      | 2,5              | °6     | 581      | 19,0             |
| °8     | 751      | 11,0             | °8     | 542      | 3,0              | °8     | 619      | 19,3             |
| 1974°0 | 0°00728  | - 12,3           | 1984°0 | 0°00535  | - 3,5            | 1994°0 | 0°00658  | + 18,8           |
| °2     | 702      | 13,0             | °2     | 528      | 3,3              | °2     | 694      | 16,5             |
| °4     | 676      | 12,8             | °4     | 522      | 2,8              | °4     | 724      | 14,5             |
| °6     | 651      | 12,8             | °6     | 517      | 1,8              | °6     | 752      | 12,3             |
| °8     | 625      | 13,5             | °8     | 515      | 1,3              | °8     | 773      | 9,8              |
| 1975°0 | 0°00597  | - 14,3           | 1985°0 | 0°00512  | - 1,5            | 1995°0 | 0°00791  | + 8,5            |
| °2     | 568      | 13,8             | °2     | 509      | - 1,0            | °2     | 807      | 6,0              |
| °4     | 542      | 12,8             | °4     | 508      | 0,0              | °4     | 815      | 3,0              |
| °6     | 517      | 12,3             | °6     | 509      | + 0,3            | °6     | 819      | + 0,5            |
| °8     | 493      | 12,5             | °8     | 509      | 0,8              | °8     | 817      | - 2,0            |
| 1976°0 | 0°00467  | - 12,0           | 1986°0 | 0°00512  | + 0,8            | 1996°0 | 0°00811  | - 4,3            |
| °2     | 445      | 10,8             | °2     | 512      | 1,0              | °2     | 800      | 7,0              |
| °4     | 424      | 10,0             | °4     | 516      | 2,0              | °4     | 783      | 7,8              |
| °6     | 405      | 8,8              | °6     | 520      | 2,0              | °6     | 769      | 8,3              |
| °8     | 389      | 7,8              | °8     | 524      | 1,5              | °8     | 750      | 10,0             |
| 1977°0 | 0°00374  | - 7,5            | 1987°0 | 0°00526  | + 1,3            | 1997°0 | 0°00729  | - 10,5           |
| °2     | 359      | 6,3              | °2     | 529      | + 0,8            | °2     | 708      | 11,3             |
| °4     | 349      | 5,0              | °4     | 529      | - 0,8            | °4     | 684      | 11,8             |
| °6     | 339      | 4,5              | °6     | 526      | 1,8              | °6     | 661      | 11,0             |
| °8     | 331      | 3,5              | °8     | 522      | 3,0              | °8     | 640      | 10,5             |
| 1978°0 | 0°00325  | - 2,5            | 1988°0 | 0°00514  | - 4,0            | 1998°0 | 0°00619  | - 10,3           |
| °2     | 321      | 1,5              | °2     | 506      | 5,0              | °2     | 599      | 8,8              |
| °4     | 319      | - 0,5            | °4     | 494      | 5,8              | °4     | 584      | 7,3              |
| °6     | 319      | + 0,8            | °6     | 483      | 7,0              | °6     | 570      | 6,8              |
| °8     | 322      | 2,5              | °8     | 466      | 9,0              | °8     | 557      | 5,3              |
| 1979°0 | 0°00329  | + 3,5            | 1989°0 | 0°00447  | - 9,8            | 1999°0 | 0°00549  | - 3,5            |
| °2     | 336      | 4,0              | °2     | 427      | 10,3             | °2     | 543      | 2,8              |
| °4     | 345      | 4,5              | °4     | 406      | 10,0             | °4     | 538      | 2,0              |
| °6     | 354      | 5,5              | °6     | 387      | 10,3             | °6     | 535      | - 0,8            |
| °8     | 367      | 7,0              | °8     | 365      | 10,8             | °8     | 535      | + 0,3            |
| 1980°0 | 0°00382  | + 7,8            | 1990°0 | 0°00344  | - 10,8           | 2000°0 | 0°00536  | + 0,5            |

Added Constant : 0°00600

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXII

Equation of Longitude

Argument K

| K     | Equation | 3                 | 4                   | K                  | Equation | 3                 | 4                   | K                  | Equation | 3                 | 4                   | K                  | Equation | 3                 | 4                   |
|-------|----------|-------------------|---------------------|--------------------|----------|-------------------|---------------------|--------------------|----------|-------------------|---------------------|--------------------|----------|-------------------|---------------------|
| K     | Equation | $\Delta$<br>0 001 | $\frac{1}{2}\Delta$ | K                  | Equation | $\Delta$<br>0 001 | $\frac{1}{2}\Delta$ | K                  | Equation | $\Delta$<br>0 001 | $\frac{1}{2}\Delta$ | K                  | Equation | $\Delta$<br>0 001 | $\frac{1}{2}\Delta$ |
| 0 000 | 0 7 00   | - 9 8             |                     | <sup>d</sup> 0 250 | 0 0 888  | + 6 1             | + 10                | <sup>d</sup> 0 500 | 8674     | + 7 4             | - 0 4               | <sup>d</sup> 0 750 | 0 1 431  | - 17              | - 0 8               |
| 005   | 6851     | 9 8               | 00                  | 255                | 9 1      | 7 1               | 10                  | 505                | 8810     | 26 9              | 06                  | 755                | 10343    | 18 1              | 10                  |
| 010   | 6702     | 29 8              |                     | 260                | 2959     | 8 1               | 10                  | 510                | 8943     | 6 4               | 04                  | 760                | 10 50    | 19 0              | 08                  |
| 015   | 6553     | 29 7              | + 2                 | 265                | 30       | 9 1               | 10                  | 515                | 9074     | 5 9               | 06                  | 765                | 10153    | 19 7              | 6                   |
| 020   | 64 5     | 9 5               |                     | 270                | 3050     | 1                 | 12                  | 520                | 9 0      | 25 4              | 04                  | 770                | 10 53    | 0 4               | 8                   |
| 025   | 6 58     | 29 3              | 02                  | 275                | 31 4     | 11                | 08                  | 525                | 93 8     | 4 9               | 06                  | 775                | 09949    | 1                 | 8                   |
| 0 030 | 0 0611   | - 9 1             | + 2                 | 0 280              | 0 0316   | + 1 1             | + 10                | 0 530              | 0 9451   | + 4               | - 0 8               | 0 780              | 0 09841  | - 0               | - 8                 |
| 035   | 5967     | 28 9              | 02                  | 285                | 32 5     | 13 1              | 10                  | 535                | 9570     | 3 5               | 6                   | 785                | 9729     | 7                 | 06                  |
| 040   | 5823     | 8 6               | 4                   | 290                | 3 93     | 14 0              | 8                   | 540                | 9686     | 9                 | 06                  | 790                | 9614     | 3 3               | 06                  |
| 045   | 5681     | 8 3               | 0                   | 295                | 3365     | 14 9              | 10                  | 545                | 9799     | 2 3               | 6                   | 795                | 9496     | 4 0               | 08                  |
| 050   | 5540     | 8 0               | 4                   | 300                | 344      | 15 8              | 8                   | 550                | 9909     | 21 6              | 08                  | 800                | 9374     | 4 7               | 06                  |
| 0 055 | 0 05401  | - 7 6             | + 0 4               | 0 305              | 0 035 3  | + 16 7            | + 1                 | 0 555              | 10015    | + 0 8             | - 0 8               | 0 805              | 0 09 49  | - 25              | - 0 4               |
| 060   | 5 64     | 7                 | 4                   | 310                | 36 9     | 17 6              | 8                   | 560                | 1 117    | 20 0              | 08                  | 810                | 9122     | 25 7              | 06                  |
| 065   | 51 9     | 6 7               | 6                   | 315                | 3699     | 18 5              | 10                  | 565                | 10 15    | 19                | 08                  | 815                | 8992     | 26 3              | 06                  |
| 070   | 4997     | 6 2               | 4                   | 320                | 3794     | 19 3              | 06                  | 570                | 1 309    | 18 3              | 10                  | 820                | 8859     | 26 8              | 04                  |
| 075   | 4867     | 5 7               | 06                  | 325                | 389      | 20 0              | 8                   | 575                | 10398    | 17 5              | 6                   | 825                | 87 4     | 27                | 04                  |
| 0 080 | 0 04740  | - 25 1            | + 0 6               | 0 330              | 0 03994  | + 20 8            | + 0 8               | 0 580              | 1 484    | + 16 7            | - 10                | 0 830              | 0 08587  | - 27 6            | - 4                 |
| 085   | 4616     | 4 6               | 04                  | 335                | 4100     | 21 6              | 08                  | 585                | 1 565    | 15 8              | 08                  | 835                | 8448     | 28 0              | 04                  |
| 090   | 4494     | 4 0               | 08                  | 340                | 4 10     | 2 3               | 06                  | 590                | 1 642    | 14 9              | 1                   | 840                | 8307     | 8 3               | 02                  |
| 095   | 4376     | 23 3              | 06                  | 345                | 4323     | 3 0               | 08                  | 595                | 10714    | 13 9              | 10                  | 845                | 8165     | 8 6               | 04                  |
| 100   | 4261     | 6                 | 08                  | 350                | 444      | 23 7              | 06                  | 600                | 10781    | 12 9              | 10                  | 850                | 8021     | 8 9               | 0                   |
| 0 105 | 0 04150  | - 21 9            | + 0 6               | 0 355              | 0 04560  | + 4 3             | + 0 6               | 0 605              | 0 1 843  | + 12 0            | - 8                 | 0 855              | 0 07876  | - 29              | - 0 4               |
| 110   | 4 4      | 1                 | 8                   | 360                | 4683     | 4 8               | 04                  | 610                | 10901    | 11 1              | 10                  | 860                | 7729     | 9 5               | - 0                 |
| 115   | 3938     | 0 4               | 8                   | 365                | 48 8     | 5 4               | 08                  | 615                | 10954    | 10 1              | 1                   | 865                | 7581     | 9 6               | 00                  |
| 120   | 3838     | 19 6              | 8                   | 370                | 4937     | 26                | 4                   | 620                | 1100     | 9 1               | 10                  | 870                | 7433     | 29 6              | 00                  |
| 125   | 374      | 18 8              | 8                   | 375                | 5068     | 26 5              | 6                   | 625                | 11 45    | 8                 | 12                  | 875                | 7 85     | 9 7               | - 0                 |
| 0 130 | 0 365    | - 18 0            | + 0 8               | 0 380              | 0 052    | + 27              | + 0 4               | 0 630              | 1108     | + 7 0             | 08                  | 0 880              | 0 07136  | - 9 8             | 00                  |
| 135   | 356      | 17                | 08                  | 385                | 5338     | 27 4              | 04                  | 635                | 11115    | 6 0               | 12                  | 885                | 6987     | 9 8               | 00                  |
| 140   | 3478     | 16 3              | 10                  | 390                | 5476     | 7 8               | 04                  | 640                | 1114     | 4 9               | 10                  | 890                | 6838     | 29 8              | 00                  |
| 145   | 3399     | 15 3              | 1                   | 395                | 5616     | 8                 | 4                   | 645                | 11164    | 3 9               | 10                  | 895                | 6689     | 9 7               | + 0 2               |
| 150   | 33 5     | 14 4              | 08                  | 400                | 5758     | 8 5               | 02                  | 650                | 11181    | 8                 | 12                  | 900                | 6541     | 9 6               | 00                  |
| 0 155 | 0 03 55  | - 13 5            | + 10                | 0 405              | 0 05901  | + 8 7             | + 0 2               | 0 655              | 0 1119   | + 1 8             | - 8                 | 0 905              | 0 06393  | - 29 5            | + 0 2               |
| 160   | 3190     | 12 5              | 10                  | 410                | 6045     | 29 0              | 04                  | 660                | 11199    | + 0 8             | 12                  | 910                | 6 46     | 29 3              | + 0 2               |
| 165   | 3130     | 11 6              | 8                   | 415                | 6191     | 9 3               | 02                  | 665                | 11 00    | - 0 4             | 12                  | 915                | 6100     | 29                | 00                  |
| 170   | 3074     | 10 6              | 1                   | 420                | 6338     | 29 5              | + 0                 | 670                | 11195    | 14                | 08                  | 920                | 5954     | 29 0              | + 0 4               |
| 175   | 3 24     | 9 6               | 8                   | 425                | 6486     | 9 6               | 00                  | 675                | 11186    | 4                 | 1                   | 925                | 581      | 28 6              | 04                  |
| 0 180 | 0 02978  | - 8 6             | + 12                | 0 430              | 0 06634  | + 9 7             | + 0 2               | 0 680              | 11171    | - 3 5             | - 10                | 0 930              | 0 05668  | - 8 3             | + 0 2               |
| 185   | 2938     | 7 6               | 08                  | 435                | 6783     | 9 8               | 00                  | 685                | 11151    | 4 6               | 12                  | 935                | 5527     | 7 9               | 6                   |
| 190   | 290      | 6 6               | 12                  | 440                | 6932     | 29 8              | 0                   | 690                | 11125    | 5 6               | 08                  | 940                | 5389     | 27 5              | 0                   |
| 195   | 287      | 5 5               | 10                  | 445                | 7081     | 29 8              | 0                   | 695                | 11 95    | 6 6               | 1                   | 945                | 5 5      | 7 2               | 04                  |
| 200   | 2847     | 4 4               | 12                  | 450                | 7 3      | 29 8              | 00                  | 700                | 11059    | 7 7               | 10                  | 950                | 5117     | 6 7               | 06                  |
| 0 205 | 0 0 828  | - 3 4             | + 0 8               | 0 455              | 0 07379  | + 29 7            | - 0 2               | 0 705              | 0 11018  | - 8 7             | - 10                | 0 955              | 0 04985  | - 26 1            | + 6                 |
| 210   | 2813     | 4                 | 12                  | 460                | 7527     | 29 6              | 0                   | 710                | 1097     | 9 7               | 10                  | 960                | 4856     | 25 6              | 04                  |
| 215   | 804      | 1 3               | 10                  | 465                | 7675     | 29 4              | - 0 4               | 715                | 10921    | 10 7              | 10                  | 965                | 4729     | 5 1               | 06                  |
| 220   | 2800     | - 0               | 1                   | 470                | 78 1     | 29 2              | 0                   | 720                | 10865    | 11 6              | 08                  | 970                | 4605     | 24 5              | 06                  |
| 225   | 2802     | + 0 8             | 08                  | 475                | 7967     | 29 1              | - 0 2               | 725                | 10805    | 12 6              | 12                  | 975                | 4484     | 23 9              | 6                   |
| 0 230 | 0 02808  | + 1 8             | + 1                 | 0 480              | 0 0811   | + 8 8             | - 0 4               | 0 730              | 0 10739  | - 13 6            | - 0 8               | 0 980              | 0 04366  | - 3 2             | + 0 8               |
| 235   | 28 0     | 3 0               | 1                   | 485                | 8 55     | 8 4               | 04                  | 735                | 10669    | 14 5              | 1                   | 985                | 4252     | 5                 | 06                  |
| 240   | 2838     | 4 0               | 08                  | 490                | 8396     | 28 1              | 02                  | 740                | 10594    | 15 4              | 08                  | 990                | 4141     | 19                | 06                  |
| 245   | 2860     | 5 0               | 12                  | 495                | 8536     | 27 8              | 04                  | 745                | 10515    | 16 3              | 10                  | 995                | 4033     | 21 1              | 10                  |
| 0 250 | 0 02888  | + 6 1             | + 10                | 0 500              | 0 08674  | + 27 4            | - 0 4               | 0 750              | 0 10431  | - 17 2            | - 0 8               | 1 000              | 0 03930  | - 20 3            | + 0 8               |

Appl dC t t +

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXII continued

Equation of Longitude

Argument K

| 1          | 2             | 3                               | 4                     | 1          | 2             | 3                               | 4                     | 1          | 2             | 3                               | 4                     | 1          | 2             | 3                               | 4                     |
|------------|---------------|---------------------------------|-----------------------|------------|---------------|---------------------------------|-----------------------|------------|---------------|---------------------------------|-----------------------|------------|---------------|---------------------------------|-----------------------|
| K          | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ | K          | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ | K          | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ | K          | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ |
| d<br>1'000 | 0°03930       | -20,3                           | +0,8                  | d<br>1'250 | 0°04819       | +25,4                           | +0,8                  | d<br>1'500 | 0°10958       | +10,1                           | -1,0                  | d<br>1'750 | 0°07568       | -29,6                           | ,00                   |
| 005        | 3830          | 19,6                            | ,08                   | 255        | 4948          | 26,0                            | ,04                   | 505        | 11006         | 9,1                             | ,10                   | 755        | 7420          | 29,6                            | ,00                   |
| 010        | 3734          | 18,8                            | ,08                   | 260        | 5080          | 26,5                            | ,05                   | 510        | 11048         | 8,0                             | ,12                   | 760        | 7272          | 29,7                            | -,02                  |
| 015        | 3643          | 18,0                            | ,08                   | 265        | 5214          | 27,0                            | ,04                   | 515        | 11085         | 7,0                             | ,08                   | 765        | 7123          | 29,8                            | ,00                   |
| 020        | 3555          | 17,2                            | ,08                   | 270        | 5350          | 27,4                            | ,04                   | 520        | 11117         | 6,0                             | ,12                   | 770        | 6974          | 29,8                            | ,00                   |
| 025        | 3471          | 16,3                            | ,10                   | 275        | 5488          | 27,8                            | ,04                   | 525        | 11144         | 4,9                             | ,10                   | 775        | 6825          | 29,8                            | ,00                   |
| 1'030      | 0°03393       | -15,3                           | +1,0                  | 1'280      | 0°05628       | +28,2                           | +0,4                  | 1'530      | 0°11166       | +3,9                            | -1,0                  | 1'780      | 0°06676       | -29,7                           | +0,2                  |
| 035        | 3319          | 14,4                            | ,08                   | 285        | 5770          | 28,5                            | ,02                   | 535        | 11182         | 2,8                             | ,12                   | 785        | 6528          | 29,6                            | ,00                   |
| 040        | 3249          | 13,5                            | ,10                   | 290        | 5913          | 28,7                            | ,02                   | 540        | 11193         | 1,8                             | ,08                   | 790        | 6380          | 29,5                            | +0,2                  |
| 045        | 3185          | 12,5                            | ,10                   | 295        | 6058          | 29,0                            | ,04                   | 545        | 11199         | +0,8                            | ,12                   | 795        | 6233          | 29,3                            | +0,2                  |
| 050        | 3125          | 11,6                            | ,08                   | 300        | 6204          | 29,3                            | ,02                   | 550        | 11200         | -0,4                            | ,12                   | 800        | 6087          | 29,2                            | ,00                   |
| 1'055      | 0°03070       | -10,6                           | +1,2                  | 1'305      | 0°06351       | +29,5                           | +0,2                  | 1'555      | 0°11194       | -1,4                            | -,08                  | 1'805      | 0°05942       | -29,0                           | +0,4                  |
| 060        | 3020          | 9,6                             | ,08                   | 310        | 6499          | 29,6                            | ,02                   | 560        | 11184         | 2,4                             | ,12                   | 810        | 5798          | 28,6                            | ,04                   |
| 065        | 2974          | 8,6                             | ,12                   | 315        | 6647          | 29,7                            | ,02                   | 565        | 11169         | 3,5                             | ,10                   | 815        | 5656          | 28,3                            | ,02                   |
| 070        | 2935          | 7,6                             | ,08                   | 320        | 6796          | 29,8                            | +0,2                  | 570        | 11149         | 4,6                             | ,12                   | 820        | 5515          | 27,9                            | ,06                   |
| 075        | 2899          | 6,6                             | ,12                   | 325        | 6945          | 29,8                            | ,00                   | 575        | 11122         | 5,6                             | ,08                   | 825        | 5377          | 27,5                            | ,02                   |
| 1'080      | 0°02870       | -5,5                            | +1,0                  | 1'330      | 0°07094       | +29,8                           | ,00                   | 1'580      | 0°11092       | -6,6                            | -,12                  | 1'830      | 0°05240       | -27,2                           | +0,4                  |
| 085        | 2845          | 4,4                             | ,12                   | 335        | 7243          | 29,8                            | ,00                   | 585        | 11056         | 7,7                             | ,10                   | 835        | 5104          | 26,7                            | ,06                   |
| 090        | 2827          | 3,4                             | ,08                   | 340        | 7392          | 29,7                            | -,02                  | 590        | 11014         | 8,7                             | ,10                   | 840        | 4974          | 26,1                            | 06                    |
| 095        | 2812          | 2,4                             | ,12                   | 345        | 7540          | 29,6                            | ,00                   | 595        | 10968         | 9,7                             | ,10                   | 845        | 4845          | 25,6                            | ,04                   |
| 1'00       | 2804          | 1,3                             | ,10                   | 350        | 7688          | 29,4                            | -,04                  | 600        | 10916         | 10,7                            | ,10                   | 850        | 4718          | 25,1                            | ,06                   |
| 1'105      | 0°02800       | -0,2                            | +1,2                  | 1'355      | 0°07834       | +29,2                           | ,00                   | 1'605      | 0°10860       | -11,6                           | -,08                  | 1'855      | 0°04595       | -24,5                           | +0,6                  |
| 110        | 2802          | +0,8                            | ,08                   | 360        | 7979          | 29,1                            | -,02                  | 610        | 10799         | 12,6                            | ,12                   | 860        | 4474          | 23,9                            | ,06                   |
| 115        | 2809          | 1,8                             | ,12                   | 365        | 8124          | 28,8                            | ,04                   | 615        | 10733         | 13,6                            | ,08                   | 865        | 4356          | 23,2                            | ,08                   |
| 120        | 2822          | 3,0                             | ,12                   | 370        | 8267          | 28,4                            | ,04                   | 620        | 10663         | 14,5                            | ,10                   | 870        | 4242          | 22,5                            | ,06                   |
| 125        | 2840          | 4,0                             | ,08                   | 375        | 8408          | 28,1                            | ,02                   | 625        | 10588         | 15,4                            | ,08                   | 875        | 4132          | 21,9                            | ,06                   |
| 1'130      | 0°02862       | +5,0                            | +1,2                  | 1'380      | 0°08548       | +27,8                           | -,04                  | 1'630      | 0°10508       | -16,3                           | -,10                  | 1'880      | 0°04024       | -21,1                           | +1,0                  |
| 135        | 2891          | 6,1                             | ,10                   | 385        | 8686          | 27,4                            | ,04                   | 635        | 10423         | 17,2                            | ,08                   | 885        | 3921          | 20,3                            | ,08                   |
| 140        | 2924          | 7,1                             | ,10                   | 390        | 8821          | 26,9                            | ,06                   | 640        | 10335         | 18,1                            | ,10                   | 890        | 3821          | 19,5                            | ,08                   |
| 145        | 2963          | 8,1                             | ,10                   | 395        | 8954          | 26,4                            | ,04                   | 645        | 10242         | 19,0                            | ,08                   | 895        | 3726          | 18,7                            | ,08                   |
| 150        | 3006          | 9,1                             | ,10                   | 400        | 9085          | 25,9                            | ,06                   | 650        | 10144         | 19,7                            | ,06                   | 900        | 3635          | 17,9                            | ,08                   |
| 1'155      | 0°03055       | +10,2                           | +1,2                  | 1'405      | 0°09213       | +25,4                           | -,04                  | 1'655      | 0°10044       | -20,4                           | -,08                  | 1'905      | 0°03547       | -17,1                           | +0,8                  |
| 160        | 3109          | 11,2                            | ,08                   | 410        | 9339          | 24,9                            | ,06                   | 660        | 9940          | 21,2                            | ,08                   | 910        | 3464          | 16,2                            | ,10                   |
| 165        | 3167          | 12,1                            | ,10                   | 415        | 9461          | 24,2                            | ,08                   | 665        | 9831          | 22,0                            | ,08                   | 915        | 3386          | 15,2                            | ,10                   |
| 170        | 3231          | 13,1                            | ,10                   | 420        | 9580          | 23,5                            | ,06                   | 670        | 9719          | 22,7                            | ,06                   | 920        | 3313          | 14,3                            | ,08                   |
| 175        | 3299          | 14,0                            | ,08                   | 425        | 9696          | 22,9                            | ,06                   | 675        | 9604          | 23,3                            | ,06                   | 925        | 3243          | 13,4                            | ,10                   |
| 1'180      | 0°03372       | +14,9                           | +1,0                  | 1'430      | 0°09808       | +22,3                           | -,06                  | 1'680      | 0°09486       | -24,0                           | -,08                  | 1'930      | 0°03179       | -12,4                           | +1,0                  |
| 185        | 3449          | 15,8                            | ,08                   | 435        | 0°09918       | 21,6                            | ,08                   | 685        | 9363          | 24,7                            | ,06                   | 935        | 3120          | 11,5                            | ,08                   |
| 190        | 3530          | 16,7                            | ,10                   | 440        | 1°0024        | 20,8                            | ,08                   | 690        | 9238          | 25,2                            | ,04                   | 940        | 3065          | 10,5                            | ,12                   |
| 195        | 3617          | 17,6                            | ,08                   | 445        | 1°0125        | 20,0                            | ,08                   | 695        | 9111          | 25,7                            | ,06                   | 945        | 3016          | 9,5                             | ,08                   |
| 200        | 3707          | 18,5                            | ,10                   | 450        | 1°0223        | 19,2                            | ,08                   | 700        | 8981          | 26,3                            | ,06                   | 950        | 2971          | 8,5                             | ,12                   |
| 1'205      | 0°03802       | +19,3                           | +0,6                  | 1'455      | 0°10317       | +18,3                           | -,10                  | 1'705      | 0°08847       | -26,8                           | -,04                  | 1'955      | 0°02932       | -7,5                            | +0,8                  |
| 210        | 3901          | 20,0                            | ,08                   | 460        | 1°0405        | 17,5                            | ,06                   | 710        | 8712          | 27,2                            | ,04                   | 960        | 2896          | 6,5                             | ,12                   |
| 215        | 4003          | 20,8                            | ,08                   | 465        | 1°0491        | 16,7                            | ,10                   | 715        | 8575          | 27,6                            | ,04                   | 965        | 2867          | 5,4                             | ,10                   |
| 220        | 4109          | 21,6                            | ,08                   | 470        | 1°0572        | 15,8                            | ,08                   | 720        | 8436          | 28,0                            | ,04                   | 970        | 2843          | 4,3                             | ,12                   |
| 225        | 4220          | 22,3                            | ,06                   | 475        | 1°0648        | 14,9                            | ,10                   | 725        | 8295          | 28,3                            | ,02                   | 975        | 2825          | 3,3                             | ,08                   |
| 1'230      | 0°04333       | +23,0                           | +0,8                  | 1'480      | 0°10720       | +13,9                           | -,10                  | 1'730      | 0°08153       | -28,6                           | -,04                  | 1'980      | 0°02811       | -2,3                            | +1,2                  |
| 235        | 4450          | 23,7                            | ,06                   | 485        | 1°0786        | 12,9                            | ,10                   | 735        | 8009          | 28,9                            | ,02                   | 985        | 2803          | 1,2                             | ,10                   |
| 240        | 4571          | 24,3                            | ,06                   | 490        | 1°0848        | 12,0                            | ,08                   | 740        | 7863          | 29,2                            | ,04                   | 990        | 2800          | -0,1                            | ,12                   |
| 245        | 4694          | 24,8                            | ,04                   | 495        | 1°0906        | 11,1                            | ,10                   | 745        | 7716          | 29,5                            | -,02                  | 995        | 2803          | +0,9                            | ,08                   |
| 1'250      | 0°04819       | +25,4                           | +0,8                  | 1'500      | 0°10958       | +10,1                           | -,10                  | 1'750      | 0°07568       | -29,6                           | ,00                   | 2'000      | 0°02810       | +1,9                            | +1,2                  |

Applied Constant: +0°07000.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXIII      Equations of Longitude      XXIV

| P                    | Equatio |
|----------------------|---------|
| <sup>d</sup><br>0 00 | 00150   |
| 02                   | 140     |
| 04                   | 129     |
| 06                   | 119     |
| 08                   | 110     |
| 10                   | 10      |
| 0 12                 | 00094   |
| 14                   | 88      |
| 16                   | 83      |
| 18                   | 79      |
| 20                   | 77      |
| 0 22                 | 0 00076 |
| 24                   | 77      |
| 26                   | 79      |
| 28                   | 82      |
| 30                   | 87      |
| 0 32                 | 0 00094 |
| 34                   | 101     |
| 36                   | 109     |
| 38                   | 118     |
| 40                   | 1 8     |
| 0 42                 | 0 00138 |
| 44                   | 149     |
| 46                   | 159     |
| 48                   | 170     |
| 50                   | 180     |
| 0 52                 | 0 0189  |
| 54                   | 197     |
| 56                   | 05      |
| 58                   | 211     |
| 60                   | 17      |
| 0 62                 | 0 00221 |
| 64                   | 2 3     |
| 66                   | 2 4     |
| 68                   | 223     |
| 70                   | 221     |
| 0 72                 | 0 00 18 |
| 74                   | 13      |
| 76                   | 207     |
| 78                   | 200     |
| 80                   | 192     |
| 0 82                 | 0 00183 |
| 84                   | 173     |
| 86                   | 163     |
| 88                   | 152     |
| 90                   | 142     |
| 0 92                 | 0 00131 |
| 94                   | 121     |
| 96                   | 112     |
| 98                   | 103     |
| 1 00                 | 0 00096 |

Add d C t t 00 5

| Q                    | Equation |
|----------------------|----------|
| <sup>d</sup><br>0 00 | 0 00050  |
| 02                   | 46       |
| 04                   | 4        |
| 06                   | 38       |
| 08                   | 35       |
| 10                   | 32       |
| 0 12                 | 0 0 029  |
| 14                   | 27       |
| 16                   | 5        |
| 18                   | 3        |
| 20                   |          |
| 0 22                 | 0 00022  |
| 24                   | 22       |
| 26                   | 3        |
| 28                   | 24       |
| 30                   | 26       |
| 0 32                 | 0 00029  |
| 34                   | 31       |
| 36                   | 35       |
| 38                   | 38       |
| 40                   | 42       |
| 0 42                 | 0 0 46   |
| 44                   | 50       |
| 46                   | 54       |
| 48                   | 57       |
| 50                   | 61       |
| 0 52                 | 0 00065  |
| 54                   | 68       |
| 56                   | 71       |
| 58                   | 73       |
| 60                   | 75       |
| 0 62                 | 0 00077  |
| 64                   | 78       |
| 66                   | 78       |
| 68                   | 78       |
| 70                   | 77       |
| 0 72                 | 0 00076  |
| 74                   | 74       |
| 76                   | 72       |
| 78                   | 69       |
| 80                   | 66       |
| 0 82                 | 0 00062  |
| 84                   | 59       |
| 86                   | 55       |
| 88                   | 51       |
| 90                   | 47       |
| 0 92                 | 0 00043  |
| 94                   | 39       |
| 96                   | 36       |
| 98                   | 32       |
| 1 00                 | 0 00030  |

Add d C t t 0005



# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXV

Equation of Variation of Radius Vector, Doubled

Argument A

| 1    | 2        | 3                      | 1    | 2        | 3                      | 1    | 2        | 3                      | 1    | 2        | 3                      |
|------|----------|------------------------|------|----------|------------------------|------|----------|------------------------|------|----------|------------------------|
| A    | Equation | $\Delta_{0d \cdot 0r}$ | A    | Equation | $\Delta_{0d \cdot 0r}$ | A    | Equation | $\Delta_{0d \cdot 0r}$ | A    | Equation | $\Delta_{0d \cdot 0r}$ |
| d    |          |                        | d    |          |                        | d    |          |                        | d    |          |                        |
| 0'00 | - '00868 | 0                      | 1'00 | + '00707 | - 12                   | 2'00 | - '00589 | + 22                   | 3'00 | + '00214 | - 28                   |
| '02  | 866      | + 2                    | '02  | 681      | 14                     | '02  | 544      | 23                     | '02  | 158      | 29                     |
| '04  | 860      | 4                      | '04  | 652      | 16                     | '04  | 496      | 25                     | '04  | 100      | 29                     |
| '06  | 849      | 6                      | '06  | 618      | 18                     | '06  | 446      | 26                     | '06  | + 42     | 29                     |
| '08  | 834      | 9                      | '08  | 582      | 19                     | '08  | 393      | 27                     | '08  | - 17     | 30                     |
| '10  | 815      | 11                     | '10  | 542      | 21                     | '10  | 339      | 27                     | '10  | 76       | 30                     |
| 0'12 | - '00792 | + 13                   | 1'12 | + '00499 | - 22                   | 2'12 | - '00284 | + 28                   | 3'12 | - '00135 | - 30                   |
| '14  | 765      | 15                     | '14  | 454      | 23                     | '14  | 228      | 29                     | '14  | 194      | 29                     |
| '16  | 734      | 16                     | '16  | 406      | 25                     | '16  | 170      | 29                     | '16  | 252      | 29                     |
| '18  | 700      | 18                     | '18  | 356      | 26                     | '18  | 112      | 29                     | '18  | 308      | 28                     |
| '20  | 662      | 20                     | '20  | 304      | 27                     | '20  | - 53     | 30                     | '20  | 363      | 27                     |
| 0'22 | - '00621 | + 21                   | 1'22 | + '00250 | - 28                   | 2'22 | + '00006 | + 29                   | 3'22 | + '00417 | - 27                   |
| '24  | 578      | 23                     | '24  | 195      | 28                     | '24  | 64       | 29                     | '24  | 469      | 25                     |
| '26  | 531      | 24                     | '26  | 138      | 29                     | '26  | 122      | 29                     | '26  | 518      | 24                     |
| '28  | 483      | 25                     | '28  | 80       | 29                     | '28  | 178      | 28                     | '28  | 566      | 23                     |
| '30  | 432      | 27                     | '30  | + 22     | 29                     | '30  | 234      | 28                     | '30  | 611      | 21                     |
| 0'32 | - '00379 | + 27                   | 1'32 | - '00036 | - 29                   | 2'32 | + '00289 | + 27                   | 3'32 | - '00651 | - 20                   |
| '34  | 324      | 28                     | '34  | 95       | 30                     | '34  | 342      | 26                     | '34  | 689      | 19                     |
| '36  | 268      | 29                     | '36  | 154      | 29                     | '36  | 393      | 25                     | '36  | 725      | 17                     |
| '38  | 210      | 29                     | '38  | 212      | 29                     | '38  | 441      | 24                     | '38  | 757      | 15                     |
| '40  | 151      | 29                     | '40  | 270      | 29                     | '40  | 487      | 22                     | '40  | 785      | 13                     |
| 0'42 | - '00093 | + 29                   | 1'42 | - '00326 | - 28                   | 2'42 | + '00530 | + 21                   | 3'42 | - '00808 | - 11                   |
| '44  | - 34     | 30                     | '44  | 380      | 27                     | '44  | 571      | 20                     | '44  | 829      | 9                      |
| '46  | + 26     | 30                     | '46  | 432      | 26                     | '46  | 609      | 18                     | '46  | 845      | 7                      |
| '48  | 84       | 29                     | '48  | 483      | 25                     | '48  | 643      | 16                     | '48  | 857      | 5                      |
| '50  | 142      | 29                     | '50  | 531      | 24                     | '50  | 674      | 15                     | '50  | 865      | 3                      |
| 0'52 | + '00198 | + 28                   | 1'52 | - '00577 | - 22                   | 2'52 | + '00701 | + 13                   | 3'52 | - '00868 | - 1                    |
| '54  | 254      | 28                     | '54  | 620      | 21                     | '54  | 724      | 11                     | '54  | 867      | + 2                    |
| '56  | 308      | 27                     | '56  | 661      | 20                     | '56  | 744      | 9                      | '56  | 861      | 4                      |
| '58  | 360      | 26                     | '58  | 698      | 18                     | '58  | 760      | 7                      | '58  | 851      | 6                      |
| '60  | 411      | 25                     | '60  | 732      | 16                     | '60  | 771      | 5                      | '60  | 838      | 8                      |
| 0'62 | + '00459 | + 23                   | 1'62 | - '00763 | - 15                   | 2'62 | + '00779 | + 3                    | 3'62 | - '00821 | + 10                   |
| '64  | 504      | 22                     | '64  | 790      | 13                     | '64  | 782      | + 1                    | '64  | 799      | 12                     |
| '66  | 546      | 21                     | '66  | 813      | 11                     | '66  | 782      | - 1                    | '66  | 773      | 14                     |
| '68  | 586      | 19                     | '68  | 833      | 9                      | '68  | 777      | 4                      | '68  | 743      | 16                     |
| '70  | 623      | 17                     | '70  | 847      | 6                      | '70  | 768      | 6                      | '70  | 710      | 18                     |
| 0'72 | + '00655 | + 15                   | 1'72 | - '00858 | - 5                    | 2'72 | + '00754 | - 8                    | 3'72 | - '00673 | + 19                   |
| '74  | 684      | 14                     | '74  | 865      | - 3                    | '74  | 737      | 10                     | '74  | 634      | 21                     |
| '76  | 710      | 12                     | '76  | 868      | 0                      | '76  | 716      | 11                     | '76  | 591      | 22                     |
| '78  | 732      | 10                     | '78  | 866      | + 2                    | '78  | 692      | 13                     | '78  | 545      | 24                     |
| '80  | 750      | 8                      | '80  | 861      | 4                      | '80  | 664      | 15                     | '80  | 496      | 25                     |
| 0'82 | + '00764 | + 6                    | 1'82 | - '00851 | + 6                    | 2'82 | + '00631 | - 17                   | 3'82 | - '00446 | + 26                   |
| '84  | 775      | 4                      | '84  | 837      | 8                      | '84  | 596      | 19                     | '84  | 393      | 27                     |
| '86  | 781      | + 2                    | '86  | 819      | 10                     | '86  | 557      | 20                     | '86  | 339      | 28                     |
| '88  | 783      | 0                      | '88  | 797      | 12                     | '88  | 515      | 22                     | '88  | 282      | 29                     |
| '90  | 780      | - 2                    | '90  | 771      | 14                     | '90  | 471      | 23                     | '90  | 225      | 29                     |
| 0'92 | + '00774 | - 4                    | 1'92 | - '00742 | + 16                   | 2'92 | + '00423 | - 24                   | 3'92 | - '00167 | + 29                   |
| '94  | 763      | 6                      | '94  | 708      | 18                     | '94  | 374      | 25                     | '94  | 108      | 30                     |
| '96  | 749      | 8                      | '96  | 671      | 19                     | '96  | 322      | 26                     | '96  | - 49     | 30                     |
| '98  | 730      | 11                     | '98  | 632      | 21                     | '98  | 269      | 27                     | '98  | + 10     | 29                     |
| 1'00 | + '00707 | - 12                   | 2'00 | - '00589 | + 22                   | 3'00 | + '00214 | - 28                   | 4'00 | + '00068 | 29                     |

Applied Constant: - '00040.

The Equation of this Table must be supplemented by those of Tables XXVI-XXIX.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Variation of Radius Vector, Doubled

**XXVI**

| <b>B</b>                  | Equation |
|---------------------------|----------|
| <sup>d</sup><br><b>00</b> | + 00009  |
| <b>1</b>                  | 9        |
| <b>2</b>                  | 11       |
| <b>3</b>                  | 11       |
| <b>4</b>                  | 13       |
| <b>5</b>                  | 13       |
| <b>06</b>                 | + 00013  |
| <b>7</b>                  | 11       |
| <b>8</b>                  | 10       |
| <b>9</b>                  | 9        |
| <b>10</b>                 | 6        |
| <b>11</b>                 | + 00005  |
| <b>2</b>                  | 5        |
| <b>3</b>                  | 6        |
| <b>4</b>                  | 7        |
| <b>5</b>                  | 1        |
| <b>16</b>                 | + 00 11  |
| <b>7</b>                  | 13       |
| <b>8</b>                  | 13       |
| <b>9</b>                  | 13       |
| <b>20</b>                 | 12       |
| <b>21</b>                 | + 00011  |
| <b>2</b>                  | 10       |
| <b>3</b>                  | 9        |
| <b>4</b>                  | 9        |
| <b>25</b>                 | + 0001   |

Add 10 t t + ∞

**XXVII**

| <b>C</b>  | Equation |
|-----------|----------|
| <b>00</b> | + 00001  |
| <b>1</b>  |          |
| <b>2</b>  | 3        |
| <b>3</b>  | 6        |
| <b>4</b>  | 9        |
| <b>5</b>  | 1        |
| <b>06</b> | + 00015  |
| <b>7</b>  | 17       |
| <b>8</b>  | 19       |
| <b>9</b>  | 19       |
| <b>10</b> | 18       |
| <b>11</b> | + 00016  |
| <b>2</b>  | 14       |
| <b>3</b>  | 11       |
| <b>4</b>  | 8        |
| <b>5</b>  | 5        |
| <b>16</b> | + 00003  |
| <b>7</b>  | 1        |
| <b>8</b>  | 1        |
| <b>9</b>  |          |
| <b>20</b> | + 00004  |

Add dC t t + ∞

**XXVIII**

| <b>D</b>                  | Equation |
|---------------------------|----------|
| <sup>d</sup><br><b>00</b> | + 00003  |
| <b>1</b>                  | 3        |
| <b>2</b>                  | 5        |
| <b>3</b>                  | 7        |
| <b>4</b>                  | 9        |
| <b>5</b>                  | 11       |
| <b>06</b>                 | + 00014  |
| <b>7</b>                  | 16       |
| <b>8</b>                  | 17       |
| <b>9</b>                  | 17       |
| <b>10</b>                 | 16       |
| <b>11</b>                 | + 0015   |
| <b>2</b>                  | 13       |
| <b>3</b>                  | 11       |
| <b>4</b>                  | 8        |
| <b>5</b>                  | 6        |
| <b>16</b>                 | + 00004  |
| <b>7</b>                  | 3        |
| <b>8</b>                  | 3        |
| <b>9</b>                  | 4        |
| <b>20</b>                 | + 00005  |

Add 10 t t + ∞

**XXIX**

| <b>E</b>                  | Equation |
|---------------------------|----------|
| <sup>d</sup><br><b>00</b> | + 00007  |
| <b>1</b>                  | 7        |
| <b>2</b>                  | 8        |
| <b>3</b>                  | 9        |
| <b>4</b>                  | 10       |
| <b>5</b>                  | 11       |
| <b>06</b>                 | + 00012  |
| <b>7</b>                  | 12       |
| <b>8</b>                  | 13       |
| <b>9</b>                  | 13       |
| <b>10</b>                 | 13       |
| <b>11</b>                 | + 00012  |
| <b>2</b>                  | 11       |
| <b>3</b>                  | 10       |
| <b>4</b>                  | 9        |
| <b>5</b>                  | 8        |
| <b>16</b>                 | + 00008  |
| <b>7</b>                  | 7        |
| <b>8</b>                  | 7        |
| <b>9</b>                  | 7        |
| <b>20</b>                 | + 00008  |

Add 10 t t + ∞

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

| XXX   |               |                                 |                       | Equation of Latitude |               |                                 |                       | Argument K |               |                                 |                       |
|-------|---------------|---------------------------------|-----------------------|----------------------|---------------|---------------------------------|-----------------------|------------|---------------|---------------------------------|-----------------------|
| 1     | 2             | 3                               | 4                     | 1                    | 2             | 3                               | 4                     | 1          | 2             | 3                               | 4                     |
| K     | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ | K                    | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ | K          | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> .001 | $\frac{1}{2}\Delta^2$ |
| d     |               |                                 |                       | d                    |               |                                 |                       | d          |               |                                 |                       |
| 0.000 | .35000        | +120,3                          | ,00                   | 0.250                | .61305        | +76,2                           | -,16                  | 0.500      | .68217        | -24,5                           | -,22                  |
| .005  | .35601        | 120,3                           | ,00                   | .255                 | .61682        | 74,6                            | ,16                   | .505       | .68089        | 26,7                            | ,20                   |
| .010  | .36203        | 120,3                           | ,00                   | .260                 | .62051        | 72,8                            | ,18                   | .510       | .67950        | 28,8                            | ,22                   |
| .015  | .36804        | 120,1                           | -,02                  | .265                 | .62410        | 71,0                            | ,18                   | .515       | .67801        | 30,9                            | ,20                   |
| .020  | .37404        | 119,9                           | ,02                   | .270                 | .62761        | 69,3                            | ,16                   | .520       | .67641        | 32,9                            | ,20                   |
| .025  | .38003        | 119,8                           | ,02                   | .275                 | .63103        | 67,6                            | ,18                   | .525       | .67472        | 34,9                            | ,20                   |
| 0.030 | .38602        | +119,6                          | -,02                  | 0.280                | .63437        | +65,8                           | -,18                  | 0.530      | .67292        | -37,0                           | -,22                  |
| .035  | .39199        | 119,4                           | ,02                   | .285                 | .63761        | 64,0                            | ,18                   | .535       | .67102        | 39,1                            | ,20                   |
| .040  | .39796        | 119,1                           | ,04                   | .290                 | .64077        | 62,2                            | ,20                   | .540       | .66901        | 41,1                            | ,20                   |
| .045  | .40390        | 118,8                           | ,02                   | .295                 | .64383        | 60,3                            | ,18                   | .545       | .66691        | 43,1                            | ,20                   |
| .050  | .40984        | 118,5                           | ,04                   | .300                 | .64680        | 58,5                            | ,18                   | .550       | .66470        | 45,1                            | ,20                   |
| 0.055 | .41575        | +118,1                          | -,04                  | 0.305                | .64968        | +56,5                           | -,20                  | 0.555      | .66240        | -47,1                           | -,20                  |
| .060  | .42165        | 117,7                           | ,04                   | .310                 | .65245        | 54,6                            | ,18                   | .560       | .65999        | 49,0                            | ,18                   |
| .065  | .42752        | 117,2                           | ,06                   | .315                 | .65514        | 52,7                            | ,20                   | .565       | .65750        | 50,9                            | ,20                   |
| .070  | .43337        | 116,6                           | ,06                   | .320                 | .65772        | 50,7                            | ,20                   | .570       | .65490        | 53,0                            | ,20                   |
| .075  | .43918        | 116,1                           | ,04                   | .325                 | .66021        | 48,8                            | ,18                   | .575       | .65220        | 54,9                            | ,18                   |
| 0.080 | .44498        | +115,6                          | -,06                  | 0.330                | .66260        | +46,9                           | -,20                  | 0.580      | .64941        | -56,7                           | -,20                  |
| .085  | .45074        | 114,9                           | ,08                   | .335                 | .66490        | 45,0                            | ,20                   | .585       | .64653        | 58,6                            | ,18                   |
| .090  | .45647        | 114,3                           | ,06                   | .340                 | .66710        | 43,0                            | ,20                   | .590       | .64355        | 60,5                            | ,18                   |
| .095  | .46217        | 113,7                           | ,06                   | .345                 | .66920        | 40,9                            | ,20                   | .595       | .64048        | 62,3                            | ,18                   |
| .100  | .46784        | 112,9                           | ,08                   | .350                 | .67119        | 38,9                            | ,20                   | .600       | .63733        | 64,1                            | ,20                   |
| 0.105 | .47346        | +112,1                          | -,08                  | 0.355                | .67309        | +36,9                           | -,20                  | 0.605      | .63407        | -66,0                           | -,16                  |
| .110  | .47905        | 111,3                           | ,08                   | .360                 | .67488        | 34,8                            | ,22                   | .610       | .63073        | 67,7                            | ,18                   |
| .115  | .48459        | 110,5                           | ,08                   | .365                 | .67657        | 32,7                            | ,20                   | .615       | .62730        | 69,4                            | ,18                   |
| .120  | .49010        | 109,7                           | ,10                   | .370                 | .67815        | 30,6                            | ,20                   | .620       | .62379        | 71,2                            | ,18                   |
| .125  | .49556        | 108,8                           | ,08                   | .375                 | .67963        | 28,5                            | ,22                   | .625       | .62018        | 72,9                            | ,16                   |
| 0.130 | .50098        | +107,9                          | -,10                  | 0.380                | .68100        | +26,5                           | -,20                  | 0.630      | .61650        | -74,6                           | -,18                  |
| .135  | .50635        | 106,9                           | ,10                   | .385                 | .68228        | 24,4                            | ,22                   | .635       | .61272        | 76,3                            | ,16                   |
| .140  | .51167        | 105,9                           | ,10                   | .390                 | .68344        | 22,3                            | ,20                   | .640       | .60887        | 77,9                            | ,16                   |
| .145  | .51694        | 104,9                           | ,10                   | .395                 | .68451        | 20,2                            | ,22                   | .645       | .60493        | 79,5                            | ,16                   |
| .150  | .52216        | 103,8                           | ,12                   | .400                 | .68546        | 18,0                            | ,20                   | .650       | .60092        | 81,1                            | ,16                   |
| 0.155 | .52732        | +102,6                          | -,12                  | 0.405                | .68631        | +15,9                           | -,22                  | 0.655      | .59682        | -82,7                           | -,16                  |
| .160  | .53242        | 101,5                           | ,10                   | .410                 | .68705        | 13,8                            | ,20                   | .660       | .59265        | 84,2                            | ,14                   |
| .165  | .53747        | 100,2                           | ,12                   | .415                 | .68769        | 11,8                            | ,22                   | .665       | .58840        | 85,7                            | ,16                   |
| .170  | .54244        | 99,0                            | ,12                   | .420                 | .68823        | 9,6                             | ,22                   | .670       | .58408        | 87,2                            | ,14                   |
| .175  | .54737        | 97,9                            | ,12                   | .425                 | .68865        | 7,4                             | ,20                   | .675       | .57968        | 88,7                            | ,16                   |
| 0.180 | .55225        | +96,8                           | -,14                  | 0.430                | .68897        | +5,3                            | -,22                  | 0.680      | .57521        | -90,1                           | -,14                  |
| .185  | .55705        | 95,4                            | ,12                   | .435                 | .68918        | 3,1                             | ,22                   | .685       | .57067        | 91,5                            | ,14                   |
| .190  | .56179        | 94,1                            | ,14                   | .440                 | .68928        | +1,0                            | ,20                   | .690       | .56606        | 93,0                            | ,14                   |
| .195  | .56646        | 92,8                            | ,14                   | .445                 | .68928        | -1,1                            | ,22                   | .695       | .56137        | 94,3                            | ,12                   |
| .200  | .57107        | 91,4                            | ,14                   | .450                 | .68917        | 3,3                             | ,22                   | .700       | .55663        | 95,6                            | ,14                   |
| 0.205 | .57560        | +89,9                           | -,14                  | 0.455                | .68895        | -5,5                            | -,22                  | 0.705      | .55181        | -96,9                           | -,12                  |
| .210  | .58006        | 88,5                            | ,14                   | .460                 | .68862        | 7,6                             | ,20                   | .710       | .54694        | 98,0                            | ,12                   |
| .215  | .58445        | 87,3                            | ,16                   | .465                 | .68819        | 9,7                             | ,22                   | .715       | .54201        | 99,2                            | ,12                   |
| .220  | .58877        | 85,6                            | ,14                   | .470                 | .68765        | 11,9                            | ,22                   | .720       | .53702        | 100,4                           | ,12                   |
| .225  | .59301        | 83,9                            | ,16                   | .475                 | .68700        | 14,0                            | ,20                   | .725       | .53197        | 101,6                           | ,12                   |
| 0.230 | .59718        | +82,6                           | -,16                  | 0.480                | .68625        | -16,2                           | -,22                  | 0.730      | .52686        | -102,8                          | -,12                  |
| .235  | .60127        | 81,0                            | ,16                   | .485                 | .68538        | 18,4                            | ,20                   | .735       | .52169        | 103,9                           | ,10                   |
| .240  | .60528        | 79,3                            | ,16                   | .490                 | .68441        | 20,4                            | ,22                   | .740       | .51647        | 104,9                           | ,10                   |
| .245  | .60920        | 77,7                            | ,16                   | .495                 | .68334        | 22,4                            | ,20                   | .745       | .51120        | 105,9                           | ,10                   |
| 0.250 | .61305        | +76,2                           | -,16                  | 0.500                | .68217        | -24,5                           | -,22                  | 0.750      | .50588        | -106,9                          | -,10                  |
| 0.750 | .50588        | -106,9                          | -,10                  | .755                 | .50051        | 107,9                           | ,10                   | .760       | .49509        | 108,9                           | ,10                   |
| .755  | .50051        | 107,9                           | ,10                   | .765                 | .48962        | 109,7                           | ,08                   | .770       | .48412        | 110,5                           | ,08                   |
| .760  | .49509        | 108,9                           | ,10                   | .775                 | .47857        | 111,4                           | ,08                   | .780       | .47298        | -112,2                          | -,08                  |
| .765  | .48962        | 109,7                           | ,08                   | .785                 | .46735        | 112,9                           | ,08                   | .790       | .46169        | 113,6                           | ,06                   |
| .770  | .48412        | 110,5                           | ,08                   | .795                 | .45599        | 114,3                           | ,08                   | .800       | .45026        | 115,0                           | ,06                   |
| .775  | .47857        | 111,4                           | ,08                   | .805                 | .44449        | -115,7                          | -,06                  | .810       | .43869        | 116,3                           | ,06                   |
| 0.780 | .47298        | -112,2                          | -,08                  | .815                 | .43286        | 116,7                           | ,04                   | .820       | .42702        | 117,1                           | ,06                   |
| .785  | .46735        | 112,9                           | ,08                   | .825                 | .42115        | 117,6                           | ,04                   | .830       | .41526        | -118,1                          | -,04                  |
| .790  | .46169        | 113,6                           | ,06                   | .835                 | .40934        | 118,5                           | ,04                   | .840       | .40341        | 118,9                           | ,04                   |
| .795  | .45599        | 114,3                           | ,08                   | .845                 | .39745        | 119,1                           | ,02                   | .850       | .39150        | 119,3                           | ,02                   |
| .800  | .45026        | 115,0                           | ,06                   | .855                 | .38552        | -119,7                          | -,04                  | .860       | .37953        | 119,9                           | ,00                   |
| 0.805 | .44449        | -115,7                          | -,06                  | .865                 | .37353        | 120,0                           | -,02                  | .870       | .36753        | 120,2                           | -,02                  |
| .810  | .43869        | 116,3                           | ,06                   | .875                 | .36151        | 120,3                           | ,00                   | .880       | .35550        | -120,2                          | ,00                   |
| .815  | .43286        | 116,7                           | ,04                   | .885                 | .34949        | 120,2                           | ,00                   | .890       | .34348        | 120,2                           | ,00                   |
| .820  | .42702        | 117,1                           | ,06                   | .895                 | .33747        | 120,3                           | ,00                   | .900       | .33145        | 120,2                           | +,02                  |
| .825  | .42115        | 117,6                           | ,04                   | .905                 | .32545        | -120,0                          | +,02                  | .910       | .31945        | 119,8                           | ,02                   |
| 0.830 | .41526        | -118,1                          | -,04                  | .915                 | .31347        | 119,6                           | ,02                   | .920       | .30749        | 119,4                           | ,02                   |
| .835  | .40934        | 118,5                           | ,04                   | .925                 | .30153        | 119,0                           | ,04                   | .930       | .29559        | -118,8                          | +,02                  |
| .840  | .40341        | 118,9                           | ,04                   | .935                 | .28965        | 118,6                           | ,04                   | .940       | .28373        | 118,1                           | ,04                   |
| .845  | .39745        | 119,1                           | ,02                   | .945                 | .27784        | 117,6                           | ,06                   | .950       | .27197        | 117,1                           | ,04                   |
| .850  | .39150        | 119,3                           | ,02                   | .955                 | .26613        | -116,6                          | +,06                  | .960       | .26031        | 116,1                           | ,06                   |
| 0.855 | .38552        | -119,7                          | -,04                  | .965                 | .25452        | 115,5                           | ,06                   | .970       | .24876        | 114,8                           | ,06                   |
| .860  | .37953        | 119,9                           | ,00                   | .975                 | .24384        | 114,2                           | ,06                   | .980       | .23734        | -113,5                          | +,08                  |
| .865  | .37353        | 120,0                           | -,02                  | .985                 | .23169        | 112,7                           | ,08                   | .990       | .22607        | 112,1                           | ,06                   |
| .870  | .36753        | 120,2                           | -,02                  | .995                 | .22048        | 111,3                           | ,10                   | .1000      | .21494        | -110,3                          | +,08                  |
| .875  | .36151        | 120,3                           | ,00                   |                      |               |                                 |                       |            |               |                                 |                       |

Added Constant: 0.35000.

For Ellipses, and as the argument of Table XXXVII, the Equation of this Table must be supplemented by those of Tables XXXI-XXXIV. For the other phenomena it must be also modified by Tables XXXV, XXXVI.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

XXX continued

Equation of Latitude

Argument K

| K     | Equation | $\Delta$<br>001 | $\frac{1}{2}\Delta$ | K     | Equation | $\Delta$<br>001 | $\frac{1}{2}\Delta$ | K     | Equation | $\Delta$<br>001 | $\frac{1}{2}\Delta$ | K     | Equation | $\Delta$<br>001 | $\frac{1}{2}\Delta$ |
|-------|----------|-----------------|---------------------|-------|----------|-----------------|---------------------|-------|----------|-----------------|---------------------|-------|----------|-----------------|---------------------|
| 1 000 | 1494     | -1103           | +08                 | 1 250 | 033      | -36             | +2                  | 1 500 | 07298    | +696            | +18                 | 1 750 | 3699     | +120            | 00                  |
| 005   | 0945     | 195             | 8                   | 255   | 172      | 305             | 0                   | 505   | 07651    | 713             | 16                  | 755   | 3399     | 11              | +02                 |
| 010   | 20399    | 187             | 1                   | 260   | 05       | 285             |                     | 510   | 811      | 730             | 18                  | 760   | 3390     | 103             | 00                  |
| 015   | 19858    | 1079            | 10                  | 265   | 01887    | 64              |                     | 515   | 08381    | 748             | 16                  | 765   | 34502    | 11              | 0                   |
| 020   | 1931     | 1069            | 10                  | 270   | 01761    | 241             | 0                   | 520   | 8759     | 765             | 18                  | 770   | 35103    | 10              | 00                  |
| 025   | 8,89     | 157             | 1                   | 275   | 01646    | 19              | 2                   | 525   | 9146     | 783             | 16                  | 775   | 35704    | 103             | 00                  |
| 1 030 | 1863     | -1047           | +10                 | 1 280 | 154      | -200            | +20                 | 1 530 | 9541     | +796            | +16                 | 1 780 | 36306    | +124            | 0                   |
| 035   | 1774     | 137             | 10                  | 285   | 1446     | 180             | 2                   | 535   | 0994     | 813             | 16                  | 785   | 36908    | 1202            | -02                 |
| 040   | 17226    | 106             | 1                   | 290   | 0136     | 158             |                     | 540   | 10354    | 83              | 14                  | 790   | 3758     | 1199            | 0                   |
| 045   | 16716    | 1014            | 1                   | 295   | 188      | 137             | 0                   | 545   | 1077     | 843             | 16                  | 795   | 38107    | 1198            | 02                  |
| 050   | 1621     | 100             | 1                   | 300   | 015      | 115             |                     | 550   | 11197    | 858             | 16                  | 800   | 38706    | 1196            |                     |
| 1 055 | 15714    | 990             | +1                  | 1 305 | 01173    | -93             | +                   | 1 555 | 11630    | +873            | +14                 | 1 805 | 39303    | +1194           | -0                  |
| 060   | 15       | 978             | 1                   | 310   | 0113     | 72              | 20                  | 560   | 1070     | 888             | 14                  | 810   | 39900    | 1191            | 04                  |
| 065   | 14736    | 967             | 1                   | 315   | 111      | 51              |                     | 565   | 12518    | 902             | 14                  | 815   | 40494    | 1187            | 04                  |
| 070   | 1455     | 954             | 14                  | 320   | 1081     | 9               | 2                   | 570   | 197      | 916             | 14                  | 820   | 41087    | 1183            | 04                  |
| 075   | 13782    | 940             | 14                  | 325   | 0107     | -8              | 0                   | 575   | 13434    | 930             | 14                  | 825   | 41677    | 1179            | 04                  |
| 1 080 | 13315    | 96              | +14                 | 1 330 | 1073     | +13             | +                   | 1 580 | 13902    | +943            | +14                 | 1 830 | 466      | +1175           | -04                 |
| 085   | 1856     | 91              | 12                  | 335   | 0185     | 35              | 2                   | 585   | 14377    | 956             | 12                  | 835   | 485      | 1171            | 04                  |
| 090   | 143      | 898             | 16                  | 340   | 01108    | 56              | 20                  | 590   | 14858    | 970             | 14                  | 840   | 43437    | 1166            | 06                  |
| 095   | 11958    | 884             | 14                  | 345   | 1141     | 77              |                     | 595   | 15347    | 983             | 12                  | 845   | 44018    | 1160            | 06                  |
| 100   | 1519     | 871             | 14                  | 350   | 01185    | 99              | 2                   | 600   | 15841    | 994             | 12                  | 850   | 44597    | 1154            | 06                  |
| 1 105 | 11087    | -856            | +16                 | 1 355 | 014      | +12             | +20                 | 1 605 | 16341    | +1006           | +12                 | 1 855 | 45172    | +1148           | -06                 |
| 110   | 10663    | 84              | 14                  | 360   | 1307     | 143             | 2                   | 610   | 16847    | 1018            | 1                   | 860   | 45745    | 1142            | 08                  |
| 115   | 10247    | 85              | 16                  | 365   | 1383     | 163             |                     | 615   | 17359    | 109             | 10                  | 865   | 46314    | 1136            | 06                  |
| 120   | 09838    | 89              | 16                  | 370   | 1470     | 184             |                     | 620   | 17876    | 1039            | 10                  | 870   | 46881    | 1129            | 08                  |
| 125   | 9438     | 793             | 16                  | 375   | 567      | 06              | 2                   | 625   | 18398    | 15              | 1                   | 875   | 47443    | 112             | 8                   |
| 1 130 | 945      | -777            | +16                 | 1 380 | 1676     | +227            | +20                 | 1 630 | 1896     | +1061           | +1                  | 1 880 | 4801     | +1111           | -08                 |
| 135   | 8661     | 760             | 18                  | 385   | 1794     | 48              |                     | 635   | 19459    | 1071            | 1                   | 885   | 48554    | 1103            | 08                  |
| 140   | 0885     | 74              | 18                  | 390   | 0194     | 69              | 20                  | 640   | 19997    | 1080            | 08                  | 890   | 49104    | 1095            | 10                  |
| 145   | 07919    | 725             | 16                  | 395   | 263      | 89              | 2                   | 645   | 0539     | 1089            | 10                  | 895   | 49649    | 186             | 08                  |
| 150   | 07560    | 709             | 16                  | 400   | 213      | 310             | 0                   | 650   | 21086    | 1098            | 08                  | 900   | 5190     | 177             | 1                   |
| 1 155 | 71       | -692            | +18                 | 1 405 | 373      | +331            | +0                  | 1 655 | 1637     | +1106           | +10                 | 1 905 | 50726    | +167            | 1                   |
| 160   | 06868    | 675             | 18                  | 410   | 544      | 35              | 20                  | 660   | 2192     | 1115            | 08                  | 910   | 5157     | 1057            | 10                  |
| 165   | 6535     | 657             | 18                  | 415   | 075      | 373             | 2                   | 665   | 75       | 112             | 06                  | 915   | 51783    | 1047            | 10                  |
| 170   | 611      | 638             | 18                  | 420   | 0917     | 393             |                     | 670   | 23314    | 1129            | 08                  | 920   | 5304     | 1036            | 12                  |
| 175   | 05897    | 60              | 18                  | 425   | 3118     | 413             | 20                  | 675   | 3881     | 1136            | 08                  | 925   | 52819    | 1024            | 12                  |
| 1 180 | 0559     | -60             | +0                  | 1 430 | 0333     | +433            | +2                  | 1 680 | 445      | +1143           | +06                 | 1 930 | 5338     | +1013           | -10                 |
| 185   | 595      | 581             | 18                  | 435   | 3551     | 453             | 20                  | 685   | 526      | 1150            | 06                  | 935   | 5383     | 100             | 12                  |
| 190   | 501      | 563             | 18                  | 440   | 03783    | 471             | 18                  | 690   | 5602     | 1156            | 06                  | 940   | 54330    | 990             | 1                   |
| 195   | 0475     | 546             | 0                   | 445   | 402      | 489             | 20                  | 695   | 618      | 1161            | 06                  | 945   | 5482     | 978             | 14                  |
| 200   | 04464    | 526             | 0                   | 450   | 047      | 51              |                     | 700   | 26763    | 1166            | 04                  | 950   | 5538     | 964             | 12                  |
| 1 205 | 406      | -506            | +18                 | 1 455 | 04532    | +531            | +0                  | 1 705 | 27348    | +1172           | +6                  | 1 955 | 55786    | +951            | -14                 |
| 210   | 3958     | 487             | 2                   | 460   | 483      | 550             | 18                  | 710   | 7935     | 1177            | 04                  | 960   | 5659     | 939             | 12                  |
| 215   | 03719    | 467             |                     | 465   | 058      | 568             | 18                  | 715   | 2855     | 1181            | 04                  | 965   | 5675     | 926             | 14                  |
| 220   | 03491    | 447             | 20                  | 470   | 05371    | 588             |                     | 720   | 29116    | 1185            | 04                  | 970   | 57185    | 91              | 14                  |
| 225   | 037      | 47              | 0                   | 475   | 05670    | 67              | 18                  | 725   | 29710    | 1189            | 04                  | 975   | 57637    | 898             | 14                  |
| 1 230 | 03064    | -47             | +20                 | 1 480 | 05978    | +65             | +18                 | 1 730 | 30305    | +1191           | +0                  | 1 980 | 58083    | +883            | -16                 |
| 235   | 02865    | 387             | 20                  | 485   | 0695     | 642             | 18                  | 735   | 30902    | 1194            | 02                  | 985   | 585      | 868             | 14                  |
| 240   | 677      | 367             | 2                   | 490   | 06620    | 660             | 18                  | 740   | 31499    | 1197            | 04                  | 990   | 58951    | 853             | 16                  |
| 245   | 0498     | 347             | 20                  | 495   | 6955     | 678             | 18                  | 745   | 3099     | 1200            | +02                 | 995   | 59373    | 837             | 14                  |
| 1 250 | 02330    | -326            | +2                  | 1 500 | 0798     | +696            | +18                 | 1 750 | 32699    | +10             | 00                  | 2 000 | 59788    | +82             | -16                 |

Add d C t t 5000 F Elp d th g t f T bl XXXVII th Eq ti f thi T bl t l ppl t d by th  
f l bl XXXI XXXIV F tl th pl m itm t b l m dia d by T l l XXXV XXXVI

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Latitude

XXXI

| 1    | 2        | 3                 | 1    | 2        | 3                 |
|------|----------|-------------------|------|----------|-------------------|
| L    | Equation | $\Delta$<br>0d'0r | L    | Equation | $\Delta$<br>0d'0r |
| d    |          |                   | d    |          |                   |
| 0'00 | 0'00300  | + 11              | 1'00 | 0'00180  | - 10              |
| 02   | 321      | 11                | 02   | 161      | 9                 |
| 04   | 342      | 10                | 04   | 143      | 9                 |
| 06   | 363      | 11                | 06   | 126      | 9                 |
| 08   | 384      | 10                | 08   | 109      | 8                 |
| 10   | 404      | 10                | 10   | 93       | 8                 |
| 0'12 | 0'00423  | + 9               | 1'12 | 0'00078  | - 7               |
| 14   | 442      | 9                 | 14   | 65       | 7                 |
| 16   | 460      | 9                 | 16   | 52       | 6                 |
| 18   | 478      | 9                 | 18   | 41       | 5                 |
| 20   | 494      | 8                 | 20   | 32       | 5                 |
| 0'22 | 0'00510  | + 8               | 1'22 | 0'00023  | - 4               |
| 24   | 524      | 7                 | 24   | 16       | 3                 |
| 26   | 538      | 7                 | 26   | 10       | 3                 |
| 28   | 550      | 6                 | 28   | 6        | 2                 |
| 30   | 561      | 5                 | 30   | 3        | - 1               |
| 0'32 | 0'00570  | + 4               | 1'32 | 0'00002  | 0                 |
| 34   | 578      | 4                 | 34   | 2        | + 1               |
| 36   | 585      | 3                 | 36   | 4        | 1                 |
| 38   | 591      | 3                 | 38   | 7        | 2                 |
| 40   | 595      | 2                 | 40   | 12       | 3                 |
| 0'42 | 0'00597  | + 1               | 1'42 | 0'00019  | + 4               |
| 44   | 598      | 0                 | 44   | 26       | 4                 |
| 46   | 597      | - 1               | 46   | 35       | 5                 |
| 48   | 595      | 1                 | 48   | 46       | 6                 |
| 50   | 592      | 2                 | 50   | 57       | 6                 |
| 0'52 | 0'00587  | - 3               | 1'52 | 0'00070  | + 7               |
| 54   | 580      | 4                 | 54   | 84       | 7                 |
| 56   | 572      | 4                 | 56   | 99       | 8                 |
| 58   | 563      | 5                 | 58   | 115      | 8                 |
| 60   | 552      | 6                 | 60   | 132      | 9                 |
| 0'62 | 0'00540  | - 6               | 1'62 | 0'00150  | + 9               |
| 64   | 527      | 7                 | 64   | 169      | 10                |
| 66   | 513      | 8                 | 66   | 188      | 10                |
| 68   | 498      | 8                 | 68   | 208      | 10                |
| 70   | 481      | 9                 | 70   | 229      | 10                |
| 0'72 | 0'00464  | - 9               | 1'72 | 0'00249  | + 10              |
| 74   | 446      | 9                 | 74   | 270      | 11                |
| 76   | 427      | 10                | 76   | 292      | 11                |
| 78   | 408      | 10                | 78   | 313      | 10                |
| 80   | 388      | 10                | 80   | 334      | 11                |
| 0'82 | 0'00367  | - 11              | 1'82 | 0'00355  | + 10              |
| 84   | 346      | 10                | 84   | 375      | 10                |
| 86   | 325      | 11                | 86   | 396      | 10                |
| 88   | 304      | 10                | 88   | 416      | 10                |
| 90   | 283      | 11                | 90   | 435      | 9                 |
| 0'92 | 0'00262  | - 10              | 1'92 | 0'00453  | + 9               |
| 94   | 241      | 11                | 94   | 471      | 9                 |
| 96   | 220      | 10                | 96   | 488      | 8                 |
| 98   | 200      | 10                | 98   | 504      | 8                 |
| 1'00 | 0'00180  | - 10              | 2'00 | 0'00519  | + 7               |

Added Constant: 0'00300.

XXXII

| 1    | 2        |
|------|----------|
| M    | Equation |
| d    |          |
| 0'00 | 0'00150  |
| 04   | 166      |
| 08   | 181      |
| 12   | 195      |
| 16   | 209      |
| 20   | 222      |
| 0'24 | 0'00233  |
| 28   | 242      |
| 32   | 250      |
| 36   | 255      |
| 40   | 259      |
| 0'44 | 0'00260  |
| 48   | 259      |
| 52   | 256      |
| 56   | 251      |
| 60   | 243      |
| 0'64 | 0'00234  |
| 68   | 223      |
| 72   | 211      |
| 76   | 197      |
| 80   | 182      |
| 0'84 | 0'00167  |
| 88   | 152      |
| 92   | 136      |
| 96   | 121      |
| 1'00 | 106      |
| 1'04 | 0'00092  |
| 08   | 80       |
| 12   | 69       |
| 16   | 59       |
| 20   | 51       |
| 1'24 | 0'00045  |
| 28   | 42       |
| 32   | 40       |
| 36   | 41       |
| 40   | 44       |
| 1'44 | 0'00049  |
| 48   | 56       |
| 52   | 65       |
| 56   | 76       |
| 60   | 88       |
| 1'64 | 0'00101  |
| 68   | 116      |
| 72   | 131      |
| 76   | 147      |
| 80   | 162      |
| 1'84 | 0'00177  |
| 88   | 192      |
| 92   | 206      |
| 96   | 219      |
| 2'00 | 0'00230  |

Added Constant: 0'00150.

XXXIII

| 1    | 2        |
|------|----------|
| N    | Equation |
| d    |          |
| 0'00 | 0'00025  |
| 04   | 28       |
| 08   | 31       |
| 12   | 34       |
| 16   | 37       |
| 20   | 40       |
| 0'24 | 0'00042  |
| 28   | 44       |
| 32   | 46       |
| 36   | 47       |
| 40   | 48       |
| 0'44 | 0'00048  |
| 48   | 48       |
| 52   | 47       |
| 56   | 46       |
| 60   | 44       |
| 0'64 | 0'00042  |
| 68   | 40       |
| 72   | 38       |
| 76   | 35       |
| 80   | 32       |
| 0'84 | 0'00029  |
| 88   | 25       |
| 92   | 22       |
| 96   | 19       |
| 1'00 | 16       |
| 1'04 | 0'00013  |
| 08   | 10       |
| 12   | 8        |
| 16   | 6        |
| 20   | 4        |
| 1'24 | 0'00003  |
| 28   | 2        |
| 32   | 2        |
| 36   | 2        |
| 40   | 3        |
| 1'44 | 0'00004  |
| 48   | 5        |
| 52   | 7        |
| 56   | 9        |
| 60   | 12       |
| 1'64 | 0'00015  |
| 68   | 18       |
| 72   | 21       |
| 76   | 24       |
| 80   | 28       |
| 1'84 | 0'00031  |
| 88   | 34       |
| 92   | 37       |
| 96   | 39       |
| 2'00 | 0'00042  |

Added Constant: 0'00025.

XXXIV

| 1   | 2        |
|-----|----------|
| O   | Equation |
| d   |          |
| 0'0 | 0'04525  |
| 1   | 4527     |
| 2   | 4529     |
| 3   | 4530     |
| 4   | 4531     |
| 5   | 4531     |
| 0'6 | 0'04530  |
| 7   | 4529     |
| 8   | 4527     |
| 9   | 4525     |
| 1'0 | 4523     |
| 1'1 | 0'04521  |
| 2   | 4520     |
| 3   | 4519     |
| 4   | 4519     |
| 5   | 4520     |
| 1'6 | 0'04522  |
| 7   | 4524     |
| 8   | 4526     |
| 9   | 4528     |
| 2'0 | 4529     |

Added Constant: 0'04525.

# SATELLITE I

## Tables of Longitude, Latitude, and Radius Vector

### XXXV—Occultations and Transits

To correct for the Jovicentric Latitude of the Earth the Satellites Latitude as derived from Tables XXX-XXXVI must be supplemented by the term—

$$\pm 143127 R_1 \sin (\odot - \Omega) / \Delta \begin{cases} +O_c \\ -T_1 \end{cases}$$

(9 15572 )

where  $R_1$   $\Delta$  are the Geocentric Distances of the Sun and Jupiter respectively and  $\Omega$  is the Ascending Node of Jupiters Orbit on the Ecliptic

The natural sign to apply for Occultations

The reversed sign to apply for Transits

The value of  $\Omega$  is given in Table C

### XXXVI

#### Correction of Latitude for Shadows and Transits

| Lat  | Corr Sh Tr |
|------|------------|
| 0 00 | - 0 00044  |
| 04   | 39         |
| 08   | 35         |
| 12   | 31         |
| 16   | 6          |
| 20   | 2          |
| 0 24 | - 0 017    |
| 28   | 13         |
| 32   | 9          |
| 36   | - 4        |
| 40   | 0          |
| 0 44 | + 0 004    |
| 48   | 9          |
| 52   | 13         |
| 56   | 17         |
| 60   |            |
| 0 64 | + 0 0 6    |
| 68   | 31         |
| 72   | 35         |
| 76   | 39         |
| 0 80 | + 00044    |

### XXXVII

#### Angle above Jupiters Orbit

| Lat  | Angle      | 3<br>Lat | 4<br>$\Delta$<br>o r |
|------|------------|----------|----------------------|
| 0 00 | - 3 655 +  | 0 80     | 911                  |
| 02   | 3 47 9     | 78       | 912                  |
| 04   | 3 905      | 76       | 912                  |
| 06   | 3 1081     | 74       | 912                  |
| 08   | 2 9256     | 72       | 913                  |
| 10   | 7430       | 70       | 913                  |
| 0 12 | - 5604 +   | 0 68     | 913                  |
| 14   | 2 3777     | 66       | 914                  |
| 16   | 2 1950     | 64       | 914                  |
| 18   | 01 3       | 62       | 914                  |
| 20   | 1 8295     | 60       | 914                  |
| 0 22 | - 1 6466 + | 0 58     | 915                  |
| 24   | 1 4637     | 56       | 915                  |
| 26   | 1 808      | 54       | 915                  |
| 28   | 1 0979     | 52       | 915                  |
| 30   | 9150       | 50       | 915                  |
| 0 32 | - 0 7320 + | 0 48     | 915                  |
| 34   | 0 5490     | 46       | 915                  |
| 36   | 0 3660     | 44       | 915                  |
| 38   | - 0 183 +  | 42       | 915                  |
| 0 40 | 0 000      | 0 40     | 915                  |

This Table is to be applied to the Latitude derived from Tables XXX-XXXIV before being added to the Sun's or Planet's Latitude

This Table gives the Angle of the Satellite above Jupiter's Orbit which is added to the Sun's or Planet's Latitude from Tables XXX-XXXIV



# SATELLITE I

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## Tables

of the

Synodic Motion,

Duration of the Phenomena of Eclipse,

Occultation, Transit and Shadow-Transit,

with

Equations for Reduction to the Middle,

Corrections for Phase

and the

Light-Curve of Eclipse



# SATELLITE I

XXXVIII

Table of Synodic Motion

| 1         | 2            | 1         | 2            | 1         | 2            | 1         | 2            |
|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|
| Angle     | Value        | Angle     | Value        | Angle     | Value        | Angle     | Value        |
| °<br>·000 | d<br>·000000 | °<br>·025 | d<br>·000123 | °<br>·050 | d<br>·000246 | °<br>·075 | d<br>·000369 |
| 1         | 5            | 26        | 128          | 51        | 251          | 76        | 374          |
| 2         | 10           | 27        | 133          | 52        | 256          | 77        | 379          |
| 3         | 15           | 28        | 138          | 53        | 261          | 78        | 383          |
| 4         | 20           | 29        | 143          | 54        | 265          | 79        | 388          |
| 5         | 25           | 30        | 147          | 55        | 270          | 80        | 393          |
| ·006      | ·000029      | ·031      | ·000152      | ·056      | ·000275      | ·081      | ·000398      |
| 7         | 34           | 32        | 157          | 57        | 280          | 82        | 403          |
| 8         | 39           | 33        | 162          | 58        | 285          | 83        | 408          |
| 9         | 44           | 34        | 167          | 59        | 290          | 84        | 413          |
| 10        | 49           | 35        | 172          | 60        | 295          | 85        | 418          |
| ·011      | ·000054      | ·036      | ·000177      | ·061      | ·000300      | ·086      | ·000423      |
| 12        | 59           | 37        | 182          | 62        | 305          | 87        | 428          |
| 13        | 64           | 38        | 187          | 63        | 310          | 88        | 433          |
| 14        | 69           | 39        | 192          | 64        | 315          | 89        | 438          |
| 15        | 74           | 40        | 197          | 65        | 320          | 90        | 442          |
| ·016      | ·000079      | ·041      | ·000202      | ·066      | ·000324      | ·091      | ·000447      |
| 17        | 84           | 42        | 206          | 67        | 329          | 92        | 452          |
| 18        | 88           | 43        | 211          | 68        | 334          | 93        | 457          |
| 19        | 93           | 44        | 216          | 69        | 339          | 94        | 462          |
| 20        | 98           | 45        | 221          | 70        | 344          | 95        | 467          |
| ·021      | ·000103      | ·046      | ·000226      | ·071      | ·000349      | ·096      | ·000472      |
| 22        | 108          | 47        | 231          | 72        | 354          | 97        | 477          |
| 23        | 113          | 48        | 236          | 73        | 359          | 98        | 482          |
| 24        | 118          | 49        | 241          | 74        | 364          | 99        | 487          |
| ·025      | ·000123      | ·050      | ·000246      | ·075      | ·000369      | ·100      | ·000492      |

XXXIX

| 1        | 2            |
|----------|--------------|
| Angle    | Value        |
| °<br>0·0 | d<br>·000000 |
| ·1       | 492          |
| ·2       | 983          |
| ·3       | 1475         |
| ·4       | 1967         |
| ·5       | 2458         |
| 0·6      | ·002950      |
| ·7       | 3441         |
| ·8       | 3933         |
| ·9       | 4425         |
| 1·0      | ·004916      |

These tables show the time taken to describe a given angle, with the Mean Synodic Motion. They are to be used for converting into time the Complement or excess of Jupiter's longitude over that of the Satellite at an assumed approximate time of conjunction.

To allow for the true Synodic Motion modify the entry of the table by applying to it its product by the Variation as taken from Tables XXV-XXIX.

# SATELLITE I

## Tables of the Phenomena

XL

Semiduration

| L t | E l O    | 3<br>Δ<br>oor | 4<br>Co<br>Sh T | L t |
|-----|----------|---------------|-----------------|-----|
| 000 | 0 043653 | + 8           | -49             | 800 |
| 004 | 43736    | 20 8          | 49              | 796 |
| 008 | 43819    | 20 5          | 49              | 792 |
| 012 | 43900    | 0 1           | 49              | 788 |
| 016 | 43980    | 2 0           | 49              | 784 |
| 020 | 44 60    | 19 8          | 49              | 780 |
| 024 | 44138    | -19 4         | -49             | 776 |
| 028 | 44 15    | 19 1          | 49              | 772 |
| 032 | 44 91    | 18 9          | 50              | 768 |
| 036 | 44366    | 18 8          | 5               | 764 |
| 040 | 44441    | 18 6          | 5               | 760 |
| 044 | 044515   | +18 4         | -50             | 756 |
| 048 | 44588    | 18            | 50              | 752 |
| 052 | 44659    | 18            | 50              | 748 |
| 056 | 4473     | 17 8          | 50              | 744 |
| 060 | 448      | 17 5          | 5               | 740 |
| 064 | 044869   | +17 0         | -50             | 736 |
| 068 | 44937    | 16 8          | 50              | 732 |
| 072 | 45 3     | 16 8          | 5               | 728 |
| 076 | 45070    | 16 5          | 50              | 724 |
| 080 | 45135    | 16 3          | 50              | 720 |
| 084 | 045199   | -16 0         | -5              | 716 |
| 088 | 45 63    | 15 8          | 51              | 712 |
| 092 | 453 6    | 15 5          | 51              | 708 |
| 096 | 45387    | 15 3          | 51              | 704 |
| 100 | 45448    | 15 0          | 51              | 700 |
| 104 | 045508   | +14 8         | -51             | 696 |
| 108 | 45567    | 14 8          | 51              | 692 |
| 112 | 456 5    | 14 5          | 51              | 688 |
| 116 | 4568     | 14 3          | 51              | 684 |
| 120 | 45739    | 14 0          | 51              | 680 |
| 124 | 045794   | +13 8         | -51             | 676 |
| 128 | 45849    | 13 6          | 51              | 672 |
| 132 | 45903    | 13 3          | 51              | 668 |
| 136 | 45955    | 13 0          | 51              | 664 |
| 140 | 460 8    | 12 8          | 51              | 660 |
| 144 | 046058   | +1 8          | -5              | 656 |
| 148 | 46109    | 12 5          | 5               | 652 |
| 152 | 46159    | 1 3           | 52              | 648 |
| 156 | 46 07    | 1             | 5               | 644 |
| 160 | 46 56    | 11 8          | 5               | 640 |
| 164 | 04630    | +11 5         | -52             | 636 |
| 168 | 46349    | 11 5          | 52              | 632 |
| 172 | 46394    | 11 3          | 5               | 628 |
| 176 | 46438    | 11 0          | 5               | 624 |
| 180 | 4648     | 10 8          | 52              | 620 |
| 184 | 04655 5  | +10 5         | -5              | 616 |
| 188 | 46567    | 10 3          | 52              | 612 |
| 192 | 46608    | 10 3          | 52              | 608 |
| 196 | 46648    | 10 0          | 52              | 604 |
| 200 | 046688   | + 9 8         | -52             | 600 |

| Lat | E l Oc  | 3<br>Δ<br>oo | 4<br>Corr<br>Sh Tr | Lat |
|-----|---------|--------------|--------------------|-----|
| 200 | 0 46688 | + 9 8        | - 5                | 600 |
| 204 | 467 6   | 9 8          | 5                  | 596 |
| 208 | 46764   | 9 5          | 5                  | 592 |
| 212 | 4680    | 9 3          | 5                  | 588 |
| 216 | 46838   | 9 0          | 5                  | 584 |
| 220 | 46874   | 8 8          | 5                  | 580 |
| 224 | 046908  | + 8 5        | -52                | 576 |
| 228 | 4694    | 8 5          | 5                  | 572 |
| 232 | 46975   | 8 3          | 53                 | 568 |
| 236 | 47007   | 8 0          | 53                 | 564 |
| 240 | 47 39   | 7 8          | 53                 | 560 |
| 244 | 047070  | + 7 8        | -53                | 556 |
| 248 | 47100   | 7 5          | 53                 | 552 |
| 252 | 47129   | 7 3          | 53                 | 548 |
| 256 | 47157   | 7 0          | 53                 | 544 |
| 260 | 47185   | 6 8          | 53                 | 540 |
| 264 | 047 11  | + 6 5        | -53                | 536 |
| 268 | 47237   | 6 5          | 53                 | 532 |
| 272 | 47 62   | 6 3          | 53                 | 528 |
| 276 | 47287   | 6 0          | 53                 | 524 |
| 280 | 47310   | 5 8          | 53                 | 520 |
| 284 | 047333  | + 5 5        | -53                | 516 |
| 288 | 47355   | 5 5          | 53                 | 512 |
| 292 | 47376   | 5 3          | 53                 | 508 |
| 296 | 47396   | 5 0          | 53                 | 504 |
| 300 | 4741    | 5            | 53                 | 500 |
| 304 | 047435  | + 4 5        | -53                | 496 |
| 308 | 47453   | 4 5          | 53                 | 492 |
| 312 | 47471   | 4 3          | 53                 | 488 |
| 316 | 47488   | 4 0          | 53                 | 484 |
| 320 | 47503   | 4 0          | 53                 | 480 |
| 324 | 047518  | + 3 8        | -53                | 476 |
| 328 | 47533   | 3 5          | 53                 | 472 |
| 332 | 47546   | 3 5          | 53                 | 468 |
| 336 | 47558   | 3 3          | 53                 | 464 |
| 340 | 47570   | 3 0          | 53                 | 460 |
| 344 | 047582  | + 2 8        | -53                | 456 |
| 348 | 47592   | 5            | 53                 | 452 |
| 352 | 4760    | 2 3          | 53                 | 448 |
| 356 | 47610   | 2 3          | 53                 | 444 |
| 360 | 47618   | 0            | 53                 | 440 |
| 364 | 0476 6  | + 1 8        | -53                | 436 |
| 368 | 47632   | 1 5          | 53                 | 432 |
| 372 | 47638   | 1 3          | 53                 | 428 |
| 376 | 47643   | 1 3          | 53                 | 424 |
| 380 | 47647   | 1 0          | 53                 | 420 |
| 384 | 047651  | + 0 8        | -53                | 416 |
| 388 | 47653   | 0 5          | 53                 | 412 |
| 392 | 47655   | 0 5          | 53                 | 408 |
| 396 | 47656   | + 3          | 53                 | 404 |
| 400 | 047657  | 0            | -53                | 400 |

Equations of  
Semiduration  
XLI

| Eel Oc   | K   | 3<br>Sh Tr |
|----------|-----|------------|
| 0 000044 | 0 0 | 00 002     |
| 45       | 1   | 8          |
| 46       | 2   | 3          |
| 47       | 3   | 37         |
| 46       | 4   | 45         |
| 46       | 5   | 45         |
| 0 00047  | 0 6 | 000035     |
| 46       | 7   | 1          |
| 45       | 8   | 6          |
| 44       | 9   | 2          |
| 45       | 10  | 10         |
| 0 000047 | 1 1 | 0 0000 5   |
| 47       | 2   | 39         |
| 46       | 3   | 46         |
| 46       | 4   | 44         |
| 47       | 5   | 33         |
| 000046   | 1 6 | 0 000018   |
| 45       | 7   | 5          |
| 44       | 8   | 3          |
| 45       | 9   | 1          |
| 0 000047 | 2 0 | 0 000028   |

All 16 t t 00 44

XLII

| a    | Eel Oc   |
|------|----------|
| 0    | + 000003 |
| 500  | +        |
| 1000 | 0        |
| 1500 | -        |
| 2000 | - 3      |
| 2500 | - 000003 |
| 3000 | - 1      |
| 3500 | + 1      |
| 4000 | + 3      |
| 4500 | + 0000 3 |

XLIII

| Ec Sh | β   | 3<br>Oc | 4<br>Tr |
|-------|-----|---------|---------|
| 6     | 0   | 11      | 1       |
| 9     | 50  | 1       | 6       |
| 1     | 100 | 10      | 10      |
| 9     | 150 | 5       | 12      |
| 6     | 200 | 1       | 11      |
| 3     | 250 | 0       | 6       |
| 2     | 300 | 2       | 2       |
| 4     | 350 | 7       | 1       |
| 6     | 400 | 11      | 1       |

S it t d O t t 300 Th Ag m t t l L t t d l i d f m T b l XXX XXXVI F Sh d w  
d T t t h t l C l 4 m t b p p l d t t l t i C l T t r y m t b t d l b y t l  
E i t l f T l l XLI XLIV F Sh d w l T i t m t l b t l f J p t Ph b y T b l l i

Th i t q l 0000  
Add d O t a t 00006

# SATELLITE I

## Tables of the Phenomena

XLIV

Equation of the Semiduration

Ecl., Oc., Sh., Tr.

| Lat.<br>Var. | 00<br>80 | 02<br>78 | 04<br>76 | 06<br>74 | 08<br>72 | 10<br>70 | 12<br>68 | 14<br>66 | 16<br>64 | 18<br>62 | 20<br>60 | 22<br>58 | 24<br>56 | 26<br>54 | 28<br>52 | 30<br>50 | 32<br>48 | 34<br>46 | 36<br>44 | 38<br>42 | 40  |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----|
| - '0100      | 75       | 68       | 62       | 56       | 51       | 46       | 42       | 37       | 33       | 30       | 27       | 24       | 22       | 19       | 17       | 16       | 14       | 13       | 12       | 12       | 12  |
| 96           | 82       | 76       | 70       | 64       | 59       | 55       | 50       | 46       | 43       | 39       | 36       | 33       | 31       | 29       | 27       | 25       | 24       | 23       | 22       | 22       | 22  |
| 92           | 89       | 83       | 77       | 72       | 67       | 62       | 58       | 54       | 51       | 47       | 45       | 42       | 40       | 38       | 36       | 34       | 33       | 32       | 31       | 31       | 31  |
| 88           | 96       | 90       | 85       | 80       | 75       | 71       | 67       | 63       | 60       | 57       | 54       | 51       | 49       | 47       | 46       | 44       | 43       | 42       | 41       | 41       | 41  |
| 84           | 103      | 97       | 92       | 87       | 83       | 79       | 75       | 71       | 68       | 65       | 62       | 60       | 58       | 56       | 54       | 52       | 52       | 51       | 50       | 50       | 50  |
| 80           | 110      | 105      | 100      | 95       | 91       | 87       | 84       | 80       | 77       | 74       | 72       | 69       | 68       | 66       | 64       | 63       | 62       | 61       | 60       | 60       | 60  |
| - '0076      | 117      | 112      | 107      | 103      | 99       | 95       | 91       | 88       | 85       | 83       | 80       | 78       | 76       | 74       | 73       | 72       | 71       | 70       | 69       | 69       | 69  |
| 72           | 124      | 119      | 115      | 111      | 107      | 103      | 100      | 97       | 94       | 92       | 90       | 88       | 86       | 84       | 83       | 82       | 81       | 80       | 79       | 79       | 79  |
| 68           | 131      | 126      | 122      | 118      | 115      | 111      | 108      | 105      | 103      | 100      | 98       | 96       | 94       | 93       | 92       | 90       | 90       | 89       | 88       | 88       | 88  |
| 64           | 138      | 134      | 130      | 126      | 123      | 120      | 117      | 114      | 112      | 109      | 107      | 106      | 104      | 103      | 101      | 100      | 100      | 99       | 98       | 98       | 98  |
| 60           | 145      | 141      | 137      | 134      | 131      | 127      | 125      | 122      | 120      | 118      | 116      | 114      | 113      | 111      | 110      | 109      | 108      | 108      | 107      | 107      | 107 |
| - '0056      | 152      | 148      | 145      | 142      | 139      | 136      | 133      | 131      | 129      | 127      | 125      | 124      | 122      | 121      | 120      | 119      | 118      | 118      | 117      | 117      | 117 |
| 52           | 159      | 155      | 152      | 149      | 146      | 144      | 141      | 139      | 137      | 135      | 134      | 132      | 131      | 130      | 129      | 128      | 127      | 127      | 126      | 126      | 126 |
| 48           | 166      | 163      | 160      | 157      | 154      | 152      | 150      | 148      | 146      | 145      | 143      | 142      | 141      | 139      | 139      | 138      | 137      | 137      | 136      | 136      | 136 |
| 44           | 173      | 170      | 167      | 165      | 162      | 160      | 158      | 156      | 154      | 153      | 152      | 150      | 149      | 148      | 147      | 147      | 146      | 146      | 145      | 145      | 145 |
| 40           | 180      | 177      | 175      | 173      | 170      | 169      | 167      | 165      | 164      | 162      | 161      | 160      | 159      | 158      | 157      | 156      | 156      | 155      | 155      | 155      | 155 |
| - '0036      | 187      | 184      | 182      | 180      | 178      | 176      | 175      | 173      | 172      | 170      | 169      | 168      | 167      | 167      | 166      | 165      | 165      | 164      | 164      | 164      | 164 |
| 32           | 194      | 192      | 190      | 188      | 186      | 185      | 183      | 182      | 181      | 180      | 179      | 178      | 177      | 176      | 176      | 175      | 175      | 174      | 174      | 174      | 174 |
| 28           | 201      | 199      | 197      | 196      | 194      | 193      | 191      | 190      | 189      | 188      | 187      | 186      | 186      | 185      | 184      | 184      | 184      | 183      | 183      | 183      | 183 |
| 24           | 208      | 206      | 205      | 204      | 202      | 201      | 200      | 199      | 198      | 197      | 197      | 196      | 195      | 195      | 194      | 194      | 194      | 193      | 193      | 193      | 193 |
| 20           | 215      | 213      | 212      | 211      | 210      | 209      | 208      | 207      | 206      | 206      | 205      | 204      | 204      | 203      | 203      | 203      | 202      | 202      | 202      | 202      | 202 |
| - '0016      | 222      | 221      | 220      | 219      | 218      | 217      | 217      | 216      | 215      | 215      | 214      | 214      | 214      | 213      | 213      | 213      | 212      | 212      | 212      | 212      | 212 |
| 12           | 229      | 228      | 227      | 227      | 226      | 225      | 225      | 224      | 224      | 223      | 223      | 222      | 222      | 222      | 222      | 221      | 221      | 221      | 221      | 221      | 221 |
| 8            | 236      | 235      | 235      | 235      | 234      | 234      | 233      | 233      | 233      | 232      | 232      | 232      | 232      | 232      | 231      | 231      | 231      | 231      | 231      | 231      | 231 |
| - '0004      | 243      | 242      | 242      | 242      | 242      | 241      | 241      | 241      | 241      | 241      | 241      | 240      | 240      | 240      | 240      | 240      | 240      | 240      | 240      | 240      | 240 |
| 0            | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250      | 250 |
| + '0004      | 257      | 258      | 258      | 258      | 258      | 259      | 259      | 259      | 259      | 259      | 259      | 260      | 260      | 260      | 260      | 260      | 260      | 260      | 260      | 260      | 260 |
| 8            | 264      | 265      | 265      | 266      | 266      | 266      | 267      | 267      | 267      | 268      | 268      | 268      | 268      | 268      | 269      | 269      | 269      | 269      | 269      | 269      | 269 |
| 12           | 271      | 272      | 273      | 274      | 274      | 275      | 275      | 276      | 276      | 277      | 277      | 278      | 278      | 278      | 278      | 279      | 279      | 279      | 279      | 279      | 279 |
| 16           | 278      | 279      | 280      | 281      | 282      | 283      | 283      | 284      | 285      | 285      | 286      | 286      | 286      | 287      | 287      | 287      | 288      | 288      | 288      | 288      | 288 |
| 20           | 285      | 287      | 288      | 289      | 290      | 291      | 292      | 293      | 294      | 294      | 295      | 296      | 296      | 297      | 297      | 297      | 298      | 298      | 298      | 298      | 298 |
| + '0024      | 292      | 294      | 295      | 297      | 298      | 299      | 300      | 301      | 302      | 303      | 303      | 304      | 305      | 305      | 306      | 306      | 306      | 307      | 307      | 307      | 307 |
| 28           | 299      | 301      | 303      | 305      | 306      | 307      | 309      | 310      | 311      | 312      | 313      | 314      | 314      | 315      | 316      | 316      | 316      | 317      | 317      | 317      | 317 |
| 32           | 306      | 308      | 310      | 312      | 314      | 315      | 317      | 318      | 319      | 320      | 321      | 322      | 323      | 324      | 324      | 325      | 325      | 326      | 326      | 326      | 326 |
| 36           | 313      | 316      | 318      | 320      | 322      | 324      | 325      | 327      | 328      | 330      | 331      | 332      | 333      | 333      | 334      | 335      | 335      | 336      | 336      | 336      | 336 |
| 40           | 320      | 323      | 325      | 327      | 330      | 331      | 333      | 335      | 336      | 338      | 339      | 340      | 341      | 342      | 343      | 344      | 344      | 345      | 345      | 345      | 345 |
| + '0044      | 327      | 330      | 333      | 335      | 338      | 340      | 342      | 344      | 346      | 347      | 348      | 350      | 351      | 352      | 353      | 353      | 354      | 354      | 355      | 355      | 355 |
| 48           | 334      | 337      | 340      | 343      | 346      | 348      | 350      | 352      | 354      | 355      | 357      | 358      | 359      | 361      | 361      | 362      | 363      | 363      | 364      | 364      | 364 |
| 52           | 341      | 345      | 348      | 351      | 354      | 356      | 359      | 361      | 363      | 365      | 366      | 368      | 369      | 370      | 371      | 372      | 373      | 373      | 374      | 374      | 374 |
| 56           | 348      | 352      | 355      | 358      | 362      | 364      | 367      | 369      | 371      | 373      | 375      | 376      | 378      | 379      | 380      | 381      | 382      | 382      | 383      | 383      | 383 |
| 60           | 355      | 359      | 363      | 366      | 370      | 373      | 375      | 378      | 380      | 382      | 384      | 386      | 387      | 389      | 390      | 391      | 392      | 392      | 393      | 393      | 393 |
| + '0064      | 362      | 366      | 370      | 374      | 377      | 380      | 383      | 386      | 388      | 391      | 393      | 394      | 396      | 397      | 399      | 400      | 400      | 401      | 402      | 402      | 402 |
| 68           | 369      | 374      | 378      | 382      | 385      | 389      | 392      | 395      | 397      | 400      | 402      | 404      | 406      | 407      | 408      | 410      | 410      | 411      | 412      | 412      | 412 |
| 72           | 376      | 381      | 385      | 389      | 393      | 397      | 400      | 403      | 406      | 408      | 410      | 412      | 414      | 416      | 417      | 418      | 419      | 420      | 421      | 421      | 421 |
| 76           | 383      | 388      | 393      | 397      | 401      | 405      | 409      | 412      | 415      | 417      | 420      | 422      | 424      | 426      | 427      | 428      | 429      | 430      | 431      | 431      | 431 |
| 80           | 390      | 395      | 400      | 405      | 409      | 413      | 416      | 420      | 423      | 426      | 428      | 431      | 432      | 434      | 436      | 437      | 438      | 439      | 440      | 440      | 440 |
| + '0084      | 397      | 403      | 408      | 413      | 417      | 421      | 425      | 429      | 432      | 435      | 438      | 440      | 442      | 444      | 446      | 448      | 449      | 449      | 450      | 450      | 450 |
| 88           | 404      | 410      | 415      | 420      | 425      | 429      | 433      | 437      | 440      | 443      | 446      | 449      | 451      | 453      | 454      | 456      | 457      | 458      | 459      | 459      | 459 |
| 92           | 411      | 417      | 423      | 428      | 433      | 438      | 442      | 446      | 449      | 453      | 455      | 458      | 460      | 462      | 464      | 466      | 467      | 468      | 469      | 469      | 469 |
| 96           | 418      | 424      | 430      | 436      | 441      | 445      | 450      | 454      | 457      | 461      | 464      | 467      | 469      | 471      | 473      | 475      | 476      | 477      | 478      | 478      | 478 |
| + '0100      | 425      | 432      | 438      | 444      | 449      | 454      | 458      | 463      | 467      | 470      | 473      | 476      | 478      | 481      | 483      | 484      | 486      | 487      | 488      | 488      | 488 |

The unit in this Table equals 0<sup>d</sup>.000001.

Added Constant: +0<sup>d</sup>.000250.

# SATELLITE I

## Tables of the Phenomena

XLV

Reductions to Middle

Argument K

| Ecl Oc   | Δ    | 3<br>K | 4<br>Sh Tr | 5<br>Δ |
|----------|------|--------|------------|--------|
| - 000034 | - 29 | 0 00   | - 000 66   | - 38   |
| 62       | 8    | 01     | 103        | 38     |
| 91       | 9    | 02     | 41         | 38     |
| 119      | 8    | 03     | 178        | 37     |
| 146      | 7    | 04     | 14         | 36     |
| 173      | 7    | 05     | 249        | 35     |
| - 000199 | - 6  | 0 06   | - 00 83    | - 34   |
| 2 4      | 5    | 07     | 316        | 33     |
| 249      | 5    | 08     | 349        | 3      |
| 73       | 3    | 09     | 380        | 30     |
| 95       | 1    | 10     | 409        | 8      |
| - 0 315  | - 20 | 0 11   | - 000436   | - 7    |
| 335      | 19   | 12     | 46         | 5      |
| 353      | 17   | 13     | 486        | 3      |
| 369      | 16   | 14     | 5 7        | 0      |
| 384      | 14   | 15     | 5 6        | 18     |
| - 0 0397 | - 12 | 0 16   | - 00054    | - 15   |
| 407      | 10   | 17     | 556        | 13     |
| 416      | 9    | 18     | 568        | 12     |
| 4 4      | 7    | 19     | 579        | 9      |
| 429      | 4    | 20     | 586        | 5      |
| - 00043  | -    | 0 21   | - 000589   | - 3    |
| 433      | - 1  | 22     | 591        | - 1    |
| 43       | + 1  | 23     | 59         | +      |
| 43       | 4    | 24     | 587        | 5      |
| 4 5      | 6    | 25     | 580        | 8      |
| - 0 418  | + 8  | 0 26   | - 00571    | + 1    |
| 41       | 10   | 27     | 56         | 1      |
| 399      | 1    | 28     | 546        | 15     |
| 387      | 13   | 29     | 53         | 17     |
| 373      | 15   | 30     | 512        | 0      |
| - 000357 | + 17 | 0 31   | - 0491     | + 23   |
| 339      | 19   | 32     | 467        | 5      |
| 3        |      | 33     | 441        | 6      |
| 30       | 1    | 34     | 4 5        | 27     |
| 78       | 23   | 35     | 387        | 30     |
| - 000 54 | + 4  | 0 36   | - 0 356    | + 3    |
| 30       | 5    | 37     | 3 4        | 33     |
| 05       | 26   | 38     | 91         | 34     |
| 179      | 27   | 39     | 57         | 35     |
| 5        | 27   | 40     | 2 2        | 36     |
| - 000125 | + 8  | 0 41   | - 000186   | + 37   |
| 97       | 28   | 42     | 149        | 37     |
| 69       | 9    | 43     | 112        | 38     |
| 4        | 9    | 44     | 74         | 38     |
| - 12     | 8    | 45     | 37         | 37     |
| + 000016 | + 28 | 0 46   | 000000     | + 37   |
| 44       | 28   | 47     | 37         | 37     |
| 7        | 28   | 48     | 73         | 36     |
| 99       | 7    | 49     | 1 9        | 35     |
| + 0001 5 | + 6  | 0 50   | + 000143   | + 34   |

| Ecl O    | Δ    | 3<br>K | 4<br>Sh Fr | 5<br>Δ |
|----------|------|--------|------------|--------|
| + 000125 | + 6  | 0 50   | + 00 143   | + 34   |
| 151      | 26   | 51     | 177        | 34     |
| 176      | 4    | 52     | 1          | 32     |
| 199      | 23   | 53     | 241        | 31     |
| 2        | 2    | 54     | 271        | 29     |
| 243      | 1    | 55     | 98         | 7      |
| + 00 63  | + 19 | 0 56   | + 0003 4   | + 5    |
| 281      | 18   | 57     | 348        | 3      |
| 298      | 16   | 58     | 370        | 1      |
| 31       | 14   | 59     | 389        | 18     |
| 3 5      | 13   | 60     | 4 6        | 17     |
| + 00337  | + 11 | 0 61   | + 0 0422   | + 15   |
| 347      | 9    | 62     | 435        | 1      |
| 355      | 7    | 63     | 446        | 9      |
| 360      | 4    | 64     | 45         | 5      |
| 363      | 3    | 65     | 456        | 4      |
| + 000365 | + 1  | 0 66   | + 000459   | +      |
| 365      | - 1  | 67     | 459        | -      |
| 363      | 3    | 68     | 456        | 4      |
| 359      | 6    | 69     | 451        | 7      |
| 35       | 8    | 70     | 442        | 10     |
| + 000344 | - 9  | 0 71   | + 000431   | - 12   |
| 334      | 11   | 72     | 418        | 15     |
| 3 2      | 13   | 73     | 4 2        | 17     |
| 308      | 15   | 74     | 384        | 0      |
| 9        | 17   | 75     | 363        | 22     |
| + 000 75 | - 18 | 0 76   | + 000340   | - 4    |
| 256      |      | 77     | 315        | 6      |
| 36       | 1    | 78     | 289        | 7      |
| 213      |      | 79     | 61         | 9      |
| 19       | 24   | 80     | 31         | 31     |
| + 000168 | 5    | 0 81   | + 000200   | - 32   |
| 143      | 26   | 82     | 167        | 34     |
| 117      | 27   | 83     | 133        | 35     |
| 90       | 27   | 84     | 97         | 36     |
| 63       | 8    | 85     | 61         | 37     |
| + 0 035  | - 28 | 0 86   | + 000 4    | - 37   |
| 7        | 8    | 87     | 12         | 37     |
| 1        | 8    | 88     | 49         | 37     |
| 49       | 29   | 89     | 86         | 38     |
| 78       | 29   | 90     | 124        | 38     |
| - 0 106  | - 28 | 0 91   | - 000161   | - 37   |
| 133      | 7    | 92     | 197        | 36     |
| 161      | 28   | 93     | 233        | 36     |
| 188      | 26   | 94     | 268        | 34     |
| 13       | 25   | 95     | 301        | 33     |
| - 000238 | - 25 | 0 96   | - 0 0334   | - 33   |
| 262      | 3    | 97     | 366        | 31     |
| 284      | 22   | 98     | 395        | 29     |
| 306      | 1    | 99     | 423        | 28     |
| - 0 0326 | - 19 | 1 00   | - 000450   | - 26   |

Sbt t l O t t      Thi T bl i l d      t tp ti      fth Eq ti fLight( I d )      Th E ty must b  
 ppl t d bytl Eq t      f l bl XLVI L      Ph wh I      tb rr t d by d d i g t it l f i t p d t by th V i t i      d w fr  
 T bl XXV XXIX      F Sh d      d T      it it m t l b      t d f J pit      Ph by l bl LI

# SATELLITE I

## Tables of the Phenomena

XLV continued

Reductions to Middle

Argument K

| 1                         | 2        | 3                    | 4                         | 5        |
|---------------------------|----------|----------------------|---------------------------|----------|
| Ecl., Oc.                 | $\Delta$ | K                    | Sh., Tr.                  | $\Delta$ |
| <sup>d</sup><br>- '000326 | - 19     | <sup>d</sup><br>1'00 | <sup>d</sup><br>- '000450 | - 26     |
| 345                       | 18       | '01                  | 475                       | 24       |
| 362                       | 17       | '02                  | 498                       | 22       |
| 378                       | 15       | '03                  | 518                       | 19       |
| 392                       | 13       | '04                  | 535                       | 17       |
| 402                       | 11       | '05                  | 550                       | 14       |
| - '000412                 | - 10     | 1'06                 | - '000563                 | - 13     |
| 421                       | 8        | '07                  | 575                       | 11       |
| 427                       | 6        | '08                  | 584                       | 7        |
| 431                       | 3        | '09                  | 588                       | 4        |
| 433                       | - 2      | '10                  | 591                       | - 2      |
| - '000433                 | 0        | 1'11                 | - '000591                 | + 1      |
| 431                       | + 3      | '12                  | 589                       | 4        |
| 428                       | 5        | '13                  | 584                       | 7        |
| 422                       | 7        | '14                  | 576                       | 9        |
| 415                       | 9        | '15                  | 565                       | 11       |
| - '000404                 | + 11     | 1'16                 | - '000553                 | + 14     |
| 392                       | 13       | '17                  | 538                       | 16       |
| 380                       | 14       | '18                  | 521                       | 19       |
| 365                       | 16       | '19                  | 502                       | 22       |
| 348                       | 18       | '20                  | 478                       | 24       |
| - '000329                 | + 20     | 1'21                 | - '000453                 | + 26     |
| 310                       | 21       | '22                  | 427                       | 27       |
| 289                       | 22       | '23                  | 401                       | 29       |
| 265                       | 24       | '24                  | 371                       | 31       |
| 241                       | 25       | '25                  | 339                       | 33       |
| - '000217                 | + 26     | 1'26                 | - '000307                 | + 34     |
| 191                       | 27       | '27                  | 273                       | 35       |
| 164                       | 27       | '28                  | 238                       | 36       |
| 138                       | 28       | '29                  | 203                       | 37       |
| 110                       | 28       | '30                  | 166                       | 37       |
| - '000082                 | + 29     | 1'31                 | - '000129                 | + 38     |
| 53                        | 29       | '32                  | 91                        | 38       |
| 25                        | 29       | '33                  | 54                        | 38       |
| 3                         | 28       | '34                  | 17                        | 37       |
| 31                        | 28       | '35                  | + 20                      | 37       |
| + '000059                 | + 28     | 1'36                 | + '000057                 | + 37     |
| 87                        | 28       | '37                  | 93                        | 36       |
| 113                       | 27       | '38                  | 127                       | 35       |
| 139                       | 26       | '39                  | 161                       | 34       |
| 165                       | 25       | '40                  | 195                       | 33       |
| + '000188                 | + 24     | 1'41                 | + '000227                 | + 32     |
| 212                       | 23       | '42                  | 258                       | 30       |
| 233                       | 22       | '43                  | 286                       | 28       |
| 254                       | 20       | '44                  | 313                       | 26       |
| 273                       | 19       | '45                  | 337                       | 24       |
| + '000291                 | + 17     | 1'46                 | + '000360                 | + 22     |
| 306                       | 15       | '47                  | 381                       | 20       |
| 319                       | 14       | '48                  | 399                       | 18       |
| 332                       | 12       | '49                  | 415                       | 16       |
| + '000343                 | + 10     | 1'50                 | + '000430                 | + 14     |

| 1                         | 2        | 3                    | 4                         | 5        |
|---------------------------|----------|----------------------|---------------------------|----------|
| Ecl., Oc.                 | $\Delta$ | K                    | Sh., Tr.                  | $\Delta$ |
| <sup>d</sup><br>+ '000343 | + 10     | <sup>d</sup><br>1'50 | <sup>d</sup><br>+ '000430 | + 14     |
| 352                       | 8        | '51                  | 442                       | 11       |
| 358                       | 6        | '52                  | 450                       | 7        |
| 362                       | 4        | '53                  | 454                       | 5        |
| 365                       | + 2      | '54                  | 458                       | + 3      |
| 365                       | 0        | '55                  | 460                       | 0        |
| + '000364                 | - 2      | 1'56                 | + '000458                 | - 3      |
| 362                       | 5        | '57                  | 454                       | 6        |
| 356                       | 7        | '58                  | 447                       | 9        |
| 348                       | 9        | '59                  | 436                       | 11       |
| 339                       | 10       | '60                  | 425                       | 14       |
| + '000328                 | - 12     | 1'61                 | + '000410                 | - 16     |
| 315                       | 14       | '62                  | 393                       | 19       |
| 300                       | 16       | '63                  | 373                       | 21       |
| 283                       | 18       | '64                  | 351                       | 23       |
| 265                       | 19       | '65                  | 327                       | 25       |
| + '000246                 | - 21     | 1'66                 | + '000301                 | - 27     |
| 225                       | 22       | '67                  | 274                       | 28       |
| 203                       | 23       | '68                  | 245                       | 30       |
| 179                       | 25       | '69                  | 215                       | 32       |
| 155                       | 26       | '70                  | 183                       | 33       |
| + '000129                 | - 27     | 1'71                 | + '000149                 | - 35     |
| 102                       | 27       | '72                  | 113                       | 36       |
| 76                        | 28       | '73                  | 78                        | 37       |
| 48                        | 28       | '74                  | 41                        | 37       |
| + 20                      | 28       | '75                  | + 5                       | 37       |
| - '000008                 | - 28     | 1'76                 | - '000032                 | - 37     |
| 36                        | 29       | '77                  | 69                        | 38       |
| 65                        | 29       | '78                  | 107                       | 38       |
| 93                        | 29       | '79                  | 144                       | 38       |
| 120                       | 28       | '80                  | 181                       | 37       |
| - '000148                 | - 28     | 1'81                 | - '000217                 | - 36     |
| 176                       | 27       | '82                  | 252                       | 35       |
| 202                       | 26       | '83                  | 286                       | 34       |
| 227                       | 25       | '84                  | 319                       | 33       |
| 251                       | 24       | '85                  | 352                       | 32       |
| - '000274                 | - 23     | 1'86                 | - '000382                 | - 30     |
| 296                       | 22       | '87                  | 410                       | 29       |
| 317                       | 20       | '88                  | 438                       | 27       |
| 336                       | 19       | '89                  | 464                       | 25       |
| 354                       | 17       | '90                  | 488                       | 23       |
| - '000370                 | - 16     | 1'91                 | - '000509                 | - 20     |
| 385                       | 14       | '92                  | 528                       | 18       |
| 398                       | 12       | '93                  | 543                       | 15       |
| 408                       | 10       | '94                  | 557                       | 13       |
| 417                       | 9        | '95                  | 569                       | 12       |
| - '000425                 | - 7      | 1'96                 | - '000580                 | - 9      |
| 429                       | 4        | '97                  | 586                       | 5        |
| 432                       | 2        | '98                  | 589                       | 3        |
| 433                       | - 1      | '99                  | 591                       | - 1      |
| - '000432                 | + 2      | 2'00                 | - '000590                 | + 2      |

Applied Constant: -0'000050.

This Table includes a constant portion of the Equation of Light (see *Introduction*).

supplemented by the Equations of Tables XLVI-L.

The Entry must be

The whole must be corrected by adding to itself its product by the Variation as drawn from

Tables XXV-XXIX.

For Shadows and Transits it must also be corrected for Jupiter's Phase by Table LI.

# SATELLITE I

## Tables of the Phenomena

XLVI

Equation of the Reduction

Occultations only

| $\gamma$ | $K$ | $0^d 0$ | $0^d 1$ | $0^d 2$ | $0^d 3$ | $0^d 4$ | $0^d 5$ | $0^d 6$ | $0^d 7$ | $0^d 8$ | $0^d 9$ | $1^d 0$ | $1^d 1$ | $1^d 2$ | $1^d 3$ | $1^d 4$ | $1^d 5$ | $1^d 6$ | $1^d 7$ | $1^d 8$ | $1^d 9$ | $2^d 0$ |
|----------|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| $\gamma$ | $K$ | $0^d 0$ | $0^d 1$ | $0^d 2$ | $0^d 3$ | $0^d 4$ | $0^d 5$ | $0^d 6$ | $0^d 7$ | $0^d 8$ | $0^d 9$ | $1^d 0$ | $1^d 1$ | $1^d 2$ | $1^d 3$ | $1^d 4$ | $1^d 5$ | $1^d 6$ | $1^d 7$ | $1^d 8$ | $1^d 9$ | $2^d 0$ |
| 0        | 0   | + 3     | + 3     | +       | + 1     | 0       | - 1     | -       | -       | 3       | 3       | 3       | -       | - 1     | 0       | +       | 1       | + 2     | + 3     | + 3     | + 3     | + 2     |
| 20       | 20  | + 5     | + 23    | + 19    | + 1     | + 4     | - 5     | - 3     | - 9     | - 3     | - 5     | - 3     | 18      | - 11    | - 2     | + 6     | + 14    | + 0     | + 24    | + 4     | + 2     | + 17    |
| 40       | 40  | + 43    | + 41    | + 33    | + 1     | + 7     | - 9     | - 3     | 34      | - 41    | - 43    | - 4     | 31      | - 19    | - 4     | + 11    | + 25    | + 36    | + 42    | + 43    | + 39    | + 30    |
| 60       | 60  | + 57    | + 54    | + 43    | + 8     | + 9     | - 1     | - 30    | - 45    | - 55    | 57      | - 5     | 41      | - 5     | - 5     | + 15    | + 33    | + 47    | + 56    | + 57    | + 51    | + 39    |
| 80       | 80  | + 64    | + 6     | + 49    | + 31    | + 10    | - 13    | - 34    | - 51    | - 61    | - 64    | 59      | - 46    | - 8     | - 6     | + 17    | + 37    | + 53    | + 6     | + 64    | + 57    | + 44    |
| 100      | 100 | + 64    | + 60    | + 48    | + 31    | + 10    | - 13    | - 34    | - 51    | 61      | - 63    | - 58    | - 46    | - 28    | - 6     | + 16    | + 37    | + 53    | + 62    | + 63    | + 57    | + 43    |
| 120      | 120 | + 56    | + 5     | + 4     | + 27    | + 8     | - 11    | - 30    | - 44    | - 53    | - 56    | - 51    | - 40    | 4       | - 5     | + 14    | + 3     | + 46    | + 54    | + 55    | + 50    | + 38    |
| 140      | 140 | + 41    | + 39    | + 31    | + 0     | + 6     | - 8     | -       | - 33    | - 39    | - 41    | - 38    | - 30    | - 18    | 4       | + 11    | + 4     | + 34    | + 4     | + 41    | + 37    | + 28    |
| 160      | 160 | + 22    | + 1     | + 17    | + 11    | + 3     | - 4     | - 1     | - 17    | - 21    | -       | -       | - 16    | - 10    | - 2     | + 6     | + 13    | + 18    | + 21    | +       | +       | + 15    |
| 180      | 180 | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| 200      | 200 | 2       | 0       | - 16    | - 11    | 3       | + 4     | + 12    | + 17    | + 1     | +       | +       | + 16    | + 9     | +       | - 6     | 1       | - 18    | - 1     | -       | - 19    | - 15    |
| 220      | 220 | 41      | - 39    | - 31    | -       | - 6     | + 8     | + 2     | + 33    | + 39    | + 41    | + 38    | + 30    | + 18    | + 4     | - 11    | - 4     | - 34    | - 40    | - 41    | 37      | 8       |
| 240      | 240 | - 56    | - 5     | - 4     | - 7     | 8       | + 11    | + 30    | + 44    | + 53    | + 56    | + 51    | + 4     | + 4     | + 5     | - 14    | 3       | - 4     | - 54    | 55      | - 50    | - 38    |
| 260      | 260 | - 64    | - 60    | - 48    | - 31    | - 10    | + 13    | + 34    | + 51    | + 61    | + 64    | + 58    | + 46    | + 28    | + 6     | - 16    | - 37    | - 53    | - 6     | - 63    | 57      | - 43    |
| 280      | 280 | - 64    | - 60    | - 49    | 31      | - 10    | + 13    | + 34    | + 51    | + 61    | + 64    | + 59    | + 46    | + 8     | + 6     | - 17    | - 37    | - 54    | - 63    | - 65    | - 58    | - 44    |
| 300      | 300 | - 57    | - 54    | - 43    | - 8     | - 9     | +       | + 30    | + 45    | + 55    | + 57    | + 53    | + 41    | + 5     | + 5     | - 15    | - 33    | - 47    | - 56    | - 57    | - 51    | - 39    |
| 320      | 320 | - 44    | - 41    | 33      | - 1     | - 7     | + 9     | + 23    | + 35    | + 4     | + 43    | + 4     | + 31    | + 19    | + 4     | - 11    | - 25    | - 36    | 4       | - 43    | 39      | - 3     |
| 340      | 340 | - 25    | - 3     | - 19    | - 12    | - 4     | + 5     | + 13    | + 2     | + 4     | + 5     | + 23    | + 18    | + 11    | +       | - 6     | - 14    | - 0     | - 4     | - 5     | 22      | - 17    |
| 360      | 360 | - 3     | - 3     | - 2     | 1       | 0       | + 1     | +       | + 2     | + 3     | + 3     | + 3     | + 2     | + 1     | 0       | - 1     | - 2     | - 3     | - 3     | - 3     | - 3     | -       |
| 380      | 380 | + 19    | + 18    | + 14    | + 9     | + 3     | - 4     | - 10    | - 15    | - 18    | 19      | - 17    | - 14    | - 8     | -       | + 5     | + 11    | + 16    | + 18    | + 19    | + 17    | + 13    |
| 400      | 400 | + 39    | + 36    | + 9     | + 19    | + 6     | - 8     | - 1     | - 31    | - 37    | - 39    | - 36    | - 8     | - 17    | - 4     | + 10    | + 2     | + 3     | + 38    | + 39    | + 35    | + 6     |

Tl i tli f l i i ∞ N C t t l i l d l

XLVII

Equation of the Reduction

Transits only

| $\gamma$ | $K$ | $0^d 0$ | $0^d 1$ | $0^d 2$ | $0^d 3$ | $0^d 4$ | $0^d 5$ | $0^d 6$ | $0^d 7$ | $0^d 8$ | $0^d 9$ | $1^d 0$ | $1^d 1$ | $1^d 2$ | $1^d 3$ | $1^d 4$ | $1^d 5$ | $1^d 6$ | $1^d 7$ | $1^d 8$ | $1^d 9$ | $2^d 0$ |
|----------|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| $\gamma$ | $K$ | $0^d 0$ | $0^d 1$ | $0^d 2$ | $0^d 3$ | $0^d 4$ | $0^d 5$ | $0^d 6$ | $0^d 7$ | $0^d 8$ | $0^d 9$ | $1^d 0$ | $1^d 1$ | $1^d 2$ | $1^d 3$ | $1^d 4$ | $1^d 5$ | $1^d 6$ | $1^d 7$ | $1^d 8$ | $1^d 9$ | $2^d 0$ |
| 0        | 0   | - 4     | - 4     | - 3     | - 2     | - 1     | + 1     | +       | + 3     | + 4     | + 4     | + 3     | + 3     | + 2     | 0       | - 1     | - 2     | - 3     | - 4     | - 4     | 3       | - 3     |
| 20       | 20  | - 33    | - 31    | 24      | 16      | - 5     | + 7     | + 17    | + 6     | + 31    | + 33    | + 30    | + 3     | + 14    | + 3     | - 8     | - 19    | - 27    | - 31    | - 33    | - 29    | - 2     |
| 40       | 40  | - 57    | - 54    | - 43    | - 8     | - 9     | + 1     | + 31    | + 45    | + 55    | + 57    | + 53    | + 41    | + 5     | + 5     | - 15    | - 33    | 47      | - 55    | - 57    | - 51    | - 39    |
| 60       | 60  | - 76    | - 71    | - 57    | - 37    | - 11    | + 16    | + 4     | + 60    | + 72    | + 76    | + 70    | + 55    | + 33    | + 7     | - 19    | 44      | - 6     | - 73    | - 76    | - 68    | - 5     |
| 80       | 80  | - 85    | - 80    | - 64    | - 4     | - 13    | + 18    | + 45    | + 67    | + 81    | + 85    | + 78    | + 61    | + 37    | + 8     | - 2     | - 49    | - 70    | - 82    | - 85    | - 76    | - 58    |
| 100      | 100 | - 84    | - 79    | - 64    | - 41    | - 13    | + 18    | + 45    | + 67    | + 80    | + 84    | + 77    | + 61    | + 36    | + 8     | - 2     | - 49    | - 70    | - 81    | - 84    | - 76    | - 58    |
| 120      | 120 | - 74    | - 70    | - 56    | 36      | - 11    | + 15    | + 40    | + 58    | + 70    | + 74    | + 68    | + 53    | + 3     | + 7     | - 19    | - 43    | - 61    | - 71    | 74      | - 66    | - 51    |
| 140      | 140 | - 55    | - 5     | - 41    | 7       | - 8     | + 11    | + 9     | + 43    | + 5     | + 55    | + 50    | + 39    | + 4     | + 5     | - 14    | - 3     | - 45    | - 53    | - 55    | - 49    | 38      |
| 160      | 160 | - 9     | - 27    | -       | - 14    | - 4     | + 6     | + 16    | + 3     | + 28    | + 9     | + 7     | + 1     | + 13    | + 3     | - 7     | - 17    | - 24    | 8       | - 9     | - 6     | - 20    |
| 180      | 180 | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| 200      | 200 | + 29    | + 7     | + 2     | + 14    | + 4     | - 6     | - 15    | - 23    | 27      | - 29    | 6       | - 21    | - 1     | - 3     | + 7     | + 17    | + 24    | + 8     | + 29    | + 6     | + 0     |
| 220      | 220 | + 54    | + 51    | + 41    | + 7     | + 8     | - 11    | - 29    | 43      | - 5     | 54      | - 50    | 39      | - 3     | - 5     | + 14    | + 3     | + 45    | + 53    | + 54    | + 49    | + 37    |
| 240      | 240 | + 74    | + 69    | + 56    | + 36    | + 11    | - 15    | 39      | - 58    | - 70    | - 74    | - 68    | - 53    | - 3     | - 7     | + 19    | + 43    | + 61    | + 71    | + 74    | + 65    | + 51    |
| 260      | 260 | + 84    | + 79    | + 64    | + 41    | + 13    | - 18    | - 45    | - 67    | - 80    | - 84    | - 77    | - 61    | 36      | - 8     | +       | + 49    | + 7     | + 81    | + 84    | + 76    | + 58    |
| 280      | 280 | + 85    | + 80    | + 64    | + 4     | + 13    | - 18    | - 45    | - 67    | - 81    | 85      | - 78    | - 61    | - 37    | - 8     | +       | + 49    | + 70    | + 8     | + 85    | + 76    | + 58    |
| 300      | 300 | + 76    | + 71    | + 57    | + 37    | + 11    | - 16    | - 41    | - 60    | - 7     | - 76    | - 7     | - 55    | - 33    | - 7     | + 19    | + 44    | + 63    | + 73    | + 76    | + 68    | + 52    |
| 320      | 320 | + 58    | + 54    | + 44    | + 8     | + 9     | - 1     | - 31    | - 46    | - 55    | - 58    | - 53    | - 42    | - 5     | - 5     | + 15    | + 34    | + 48    | + 56    | + 58    | + 52    | + 4     |
| 340      | 340 | + 33    | + 31    | + 5     | + 16    | + 5     | - 7     | - 18    | - 6     | - 31    | - 33    | - 30    | - 4     | - 14    | - 3     | + 8     | + 19    | + 7     | + 3     | + 33    | + 29    | + 22    |
| 360      | 360 | + 4     | + 4     | + 3     | +       | + 1     | - 1     | - 2     | - 3     | - 4     | - 4     | - 4     | - 3     | -       | 0       | + 1     | +       | + 3     | + 4     | + 4     | + 4     | + 3     |
| 380      | 380 | - 25    | - 24    | 19      | - 1     | - 4     | + 5     | + 13    | +       | + 4     | + 25    | + 23    | + 18    | + 11    | +       | - 6     | - 15    | - 21    | - 4     | - 25    | - 2     | - 17    |
| 400      | 400 | - 51    | - 48    | - 39    | - 25    | - 8     | + 11    | + 8     | + 41    | + 49    | + 51    | + 47    | + 37    | + 2     | + 5     | - 13    | - 30    | - 4     | - 50    | - 51    | - 46    | - 35    |

Th t t l T bl ∞ N C t t h b d d d

# SATELLITE I

## Tables of the Phenomena

Equations of the Reduction  
XLVIII

| 1        | 2              |
|----------|----------------|
| A        | E., O., S., T. |
| d<br>0'0 | + '000035      |
| '1       | 46             |
| '2       | 57             |
| '3       | 64             |
| '4       | 68             |
| '5       | 67             |
| 0'6      | + '000063      |
| '7       | 55             |
| '8       | 44             |
| '9       | 32             |
| 1'0      | 21             |
| '1       | + '000011      |
| '2       | 4              |
| '3       | 1              |
| '4       | 3              |
| '5       | 8              |
| 1'6      | + '000016      |
| '7       | 27             |
| '8       | 39             |
| '9       | 50             |
| 2'0      | 60             |
| 2'1      | + '000066      |
| '2       | 68             |
| '3       | 66             |
| '4       | 60             |
| '5       | 51             |
| 2'6      | + '000040      |
| '7       | 28             |
| '8       | 17             |
| '9       | 8              |
| 3'0      | 3              |
| 3'1      | + '000001      |
| '2       | 4              |
| '3       | 10             |
| '4       | 20             |
| '5       | 31             |
| 3'6      | + '000043      |
| '7       | 54             |
| '8       | 63             |
| '9       | 67             |
| 4'0      | + '000068      |

Added Constant: +0'000035.

XLIX

| 1         | 2              |
|-----------|----------------|
| P         | E., O., S., T. |
| d<br>0'00 | + '000010      |
| '05       | 8              |
| '10       | 5              |
| '15       | 4              |
| '20       | 3              |
| '25       | 3              |
| 0'30      | + '000004      |
| '35       | 6              |
| '40       | 8              |
| '45       | 10             |
| '50       | 13             |
| 0'55      | + '000015      |
| '60       | 17             |
| '65       | 18             |
| '70       | 17             |
| '75       | 16             |
| 0'80      | + '000014      |
| '85       | 12             |
| '90       | 9              |
| '95       | 7              |
| 1'00      | + '000004      |

Added Constant: +0'000070.

L

| 1        | 2              |
|----------|----------------|
| Q        | E., O., S., T. |
| d<br>0'0 | + '000005      |
| '1       | 3              |
| '2       | 2              |
| '3       | 2              |
| '4       | 4              |
| '5       | 6              |
| 0'6      | + '000008      |
| '7       | 8              |
| '8       | 7              |
| '9       | 5              |
| 1'0      | + '000003      |

Added Constant: +0'000005.

LI Corrections for Phase Sh., Tr.

| 1                                    | 2          | 3                                  | 4                  | 5                               |
|--------------------------------------|------------|------------------------------------|--------------------|---------------------------------|
| Additional Equation to Semiduration. | P ±        | Correcting Factor to Semiduration. | $\Delta$<br>0d'001 | Correcting Factor to Reduction. |
| d<br>'000000                         | d<br>0'000 | '00000                             | 0                  | 0'0000                          |
| 0                                    | '002       | - '00003                           | - 3                | - 0'0001                        |
| 0                                    | '004       | 11                                 | 5                  | 2                               |
| 0                                    | '006       | 24                                 | 8                  | 5                               |
| 0                                    | '008       | 42                                 | 10                 | 8                               |
| + 1                                  | '010       | 65                                 | 13                 | 13                              |
| + '000001                            | 0'012      | - '00093                           | - 16               | - '0018                         |
| 1                                    | '014       | 127                                | 18                 | 25                              |
| 2                                    | '016       | 166                                | 21                 | 33                              |
| 2                                    | '018       | 210                                | 23                 | 41                              |
| 2                                    | '020       | 259                                | 26                 | 51                              |
| + '000003                            | 0'022      | - '00313                           | - 29               | - '0061                         |
| 3                                    | '024       | 373                                | 31                 | 73                              |
| 4                                    | '026       | 438                                | 34                 | 86                              |
| 4                                    | '028       | 508                                | 36                 | 100                             |
| 5                                    | '030       | 583                                | 39                 | 115                             |
| + '000006                            | 0'032      | - '00664                           | - 42               | - '0131                         |
| 6                                    | '034       | 750                                | 44                 | 148                             |
| 7                                    | '036       | 840                                | 46                 | 165                             |
| 8                                    | '038       | 935                                | 49                 | 184                             |
| 9                                    | '040       | 1036                               | 52                 | 205                             |
| + '000010                            | 0'042      | - '01142                           | - 54               | - '0226                         |
| 11                                   | '044       | 1253                               | 57                 | 248                             |
| 12                                   | '046       | 1369                               | 59                 | 272                             |
| 13                                   | '048       | 1490                               | 62                 | 296                             |
| 14                                   | '050       | 1616                               | 65                 | 322                             |
| + '000015                            | 0'052      | - '01748                           | - 67               | - '0349                         |
| 16                                   | '054       | 1884                               | 70                 | 377                             |
| 16                                   | '056       | 2026                               | 72                 | 406                             |
| 17                                   | '058       | 2173                               | 75                 | 437                             |
| 17                                   | '060       | 2324                               | 77                 | 468                             |
| 17                                   | '062       | 2482                               | 81                 | 501                             |
| + '000017                            | 0'064      | - '02649                           | - 86               | - '0536                         |

The Argument of this Table is the Annual Parallax  $p$ , computed from the Approximate Tables IV, V, VI.

No Constant has been added to Column 1, which gives an Additional Equation to the Semiduration. Columns 3 and 4 must be multiplied into the Semiduration as taken from Tables XL-XLIV, and the Reduction as taken from Tables XLV-L, respectively, and the products taken as further corrections to these quantities.

When  $p$  is positive, these corrections apply to Shadow Ingress and Transit Egress; when  $p$  is negative, they apply to Shadow Egress and Transit Ingress.

# SATELLITE I

## Tables of the Phenomena

**LII**  
Standard Light Curve of Eclipse

| /   | M gnitude |
|-----|-----------|
| -50 | 000       |
| 40  |           |
| 38  | 04        |
| 36  | 6         |
| 34  | 08        |
| 32  | 11        |
| -30 | 013       |
| 28  | 16        |
| 26  | 19        |
| 24  | 22        |
| 22  | 5         |
| 20  | 29        |
| 18  | 32        |
| 16  | 35        |
| 14  | 39        |
| 12  | 43        |
| -10 | 048       |
| 08  | 53        |
| 06  | 58        |
| 04  | 64        |
| -02 | 7         |
| 00  | 075       |

Lh C di t k i t l f t  
s w l l i t f l y p l t  
s t l l t

| /   | M gnitude |
|-----|-----------|
| 00  | 075       |
| +02 | 8         |
| 04  | 88        |
| 06  | 95        |
| 08  | 103       |
| 10  | 110       |
| +12 | 119       |
| 14  | 18        |
| 16  | 138       |
| 18  | 15        |
| 20  | 161       |
| +22 | 173       |
| 24  | 187       |
| 26  | 0         |
| 28  | 218       |
| 30  | 37        |
| +32 | 256       |
| 34  | 78        |
| 36  | 30        |
| 38  | 333       |
| 40  | 374       |
| +42 | 430       |

l t l f t l i f t l  
f t h c t i t l

**LIII—Mean Motion**  
in Light Curve

| Latitude | $\Delta$ / per 1 | Latitude |
|----------|------------------|----------|
| 00       | 0416             | 80       |
| 02       | 41               | 78       |
| 04       | 45               | 76       |
| 06       | 48               | 74       |
| 08       | 43               | 72       |
| 10       | 435              | 70       |
| 12       | 0438             | 68       |
| 14       | 441              | 66       |
| 16       | 444              | 64       |
| 18       | 446              | 62       |
| 20       | 449              | 60       |
| 22       | 0451             | 58       |
| 24       | 45               | 56       |
| 26       | 454              | 54       |
| 28       | 455              | 52       |
| 30       | 456              | 50       |
| 32       | 0457             | 48       |
| 34       | 458              | 46       |
| 36       | 459              | 44       |
| 38       | 459              | 42       |
| 40       | 0459             | 40       |

**LIV—Equation**  
of Motion

| Vari tion | Co rection |
|-----------|------------|
| -010      | +002       |
| -005      | +0001      |
| 000       | 0000       |
| +005      | 001        |
| +010      | -00        |

l l A g u t f t l i T b l  
i t l V i t l i l l f m  
T b l XXV XXIX t l C  
t l i t b p l l l t t l  
E q t l f l b l T l l l

T l \ l l i t y f l p  
d i l f m l l l L l l l L l V  
i t l t k l l h l g  
+ f D l p l  
f R p p





# SATELLITE II



## Approximate Tables

of

Heliocentric and Geocentric Conjunction

# SATELLITE II

## Approximate Tables of Conjunction

### I Epochs of Conjunction

| 1            | 2                      | 3                              | 4                      | 5                              | 6                      | 7                   | 8                     | 9                    |  |
|--------------|------------------------|--------------------------------|------------------------|--------------------------------|------------------------|---------------------|-----------------------|----------------------|--|
| Year         | Conjunction            | Variation for 100 <sup>d</sup> | $\alpha$               | Variation for 100 <sup>d</sup> | $\beta$                | $\gamma$            | $\delta$              | $\epsilon$           |  |
| <b>1850</b>  | <sup>d</sup><br>2'3345 | ...                            | <sup>d</sup><br>1787'4 | + '04                          | <sup>d</sup><br>334'70 | <sup>d</sup><br>1'9 | <sup>d</sup><br>0'911 | <sup>d</sup><br>1'95 | The constant - 0 <sup>d</sup> .1000 has been applied to each entry in column 2.  |
| <b>1851</b>  | 3'4062                 | ...                            | 2153'6                 | + '04                          | 301'89                 | 2'7                 | 0'335                 | 2'25                 |  |
| <b>*1852</b> | 0'9240                 | ...                            | 2516'3                 | + '04                          | 265'53                 | 365'2               | 3'255                 | 2'54                 |  |
| <b>1853</b>  | 0'9958                 | ...                            | 2882'5                 | + '01                          | 232'71                 | 0'8                 | 2'679                 | 2'84                 |  |
| <b>1854</b>  | 2'0675                 | ...                            | 3248'6                 | + '01                          | 199'90                 | 1'6                 | 2'102                 | 3'14                 |  |
| <b>1855</b>  | 3'1393                 | ...                            | 3614'8                 | - '03                          | 167'09                 | 2'4                 | 1'526                 | 3'44                 | The constant - 0 <sup>d</sup> .080 has been applied to each entry in columns 8, 9.   |
| <b>*1856</b> | 0'6566                 | ...                            | 3977'1                 | - '04                          | 130'72                 | 364'9               | 0'921                 | 0'19                 |  |
| <b>1857</b>  | 0'7283                 | ...                            | 10'4                   | - '01                          | 97'91                  | 0'5                 | 0'344                 | 0'49                 |  |
| <b>1858</b>  | 1'7999                 | ...                            | 376'4                  | - '01                          | 65'10                  | 1'3                 | 3'293                 | 0'79                 |  |
| <b>1859</b>  | 2'8716                 | ...                            | 742'5                  | + '01                          | 32'29                  | 2'1                 | 2'716                 | 1'09                 |  |
| <b>*1860</b> | 0'3893                 | ...                            | 1105'1                 | + '04                          | 394'80                 | 364'6               | 2'111                 | 1'39                 | For Eclipses the argument $\gamma$ is not wanted.  |
| <b>1861</b>  | 0'4612                 | + '0001                        | 1471'4                 | + '07                          | 361'99                 | 0'2                 | 1'535                 | 1'69                 |  |
| <b>1862</b>  | 1'5331                 | ...                            | 1837'7                 | + '04                          | 329'18                 | 1'0                 | 0'958                 | 1'99                 |  |
| <b>1863</b>  | 2'6048                 | ...                            | 2203'8                 | - '04                          | 296'37                 | 1'8                 | 0'382                 | 2'29                 |  |
| <b>*1864</b> | 0'1222                 | - '0001                        | 2566'0                 | - '13                          | 260'00                 | 364'3               | 3'302                 | 2'59                 |  |
| <b>1865</b>  | 0'1934                 | - '0001                        | 2931'5                 | - '16                          | 227'19                 | 365'1               | 2'725                 | 2'89                 | Column 2 corrected by the equations from the following tables, gives superior conjunction as required for Eclipses and Occultations. To find inferior conjunction for Shadows and Transits, add (or subtract) one half the synodic period, i. e. 1 <sup>d</sup> .7770, to the numbers of columns 2, 4, 6, 7, 8, 9. |
| <b>1866</b>  | 1'2647                 | - '0002                        | 3297'1                 | - '20                          | 194'38                 | 0'7                 | 2'149                 | 3'19                 |  |
| <b>1867</b>  | 2'3356                 | - '0001                        | 3662'2                 | - '17                          | 161'56                 | 1'5                 | 1'573                 | 3'48                 |  |
| <b>*1868</b> | 3'4071                 | ...                            | 4028'0                 | - '04                          | 128'75                 | 2'3                 | 0'996                 | 0'23                 |  |
| <b>1869</b>  | 3'4788                 | ...                            | 61'6                   | + '06                          | 95'94                  | 3'1                 | 0'420                 | 0'53                 |  |
| <b>1870</b>  | 0'9967                 | + '0001                        | 424'5                  | + '16                          | 59'57                  | 0'4                 | 3'340                 | 0'83                 |  |
| <b>1871</b>  | 2'0690                 | + '0002                        | 791'3                  | + '21                          | 26'76                  | 1'2                 | 2'763                 | 1'13                 |  |
| <b>*1872</b> | 3'1414                 | + '0002                        | 1158'1                 | + '20                          | 392'83                 | 2'0                 | 2'187                 | 1'43                 |  |
| <b>1873</b>  | 3'2135                 | + '0001                        | 1524'8                 | + '13                          | 360'02                 | 2'8                 | 1'610                 | 1'73                 |  |
| <b>1874</b>  | 0'7314                 | ...                            | 1887'6                 | + '03                          | 323'65                 | 0'0                 | 1'005                 | 2'03                 |  |
| <b>1875</b>  | 1'8030                 | - '0001                        | 2253'6                 | - '10                          | 290'84                 | 0'9                 | 0'429                 | 2'33                 |  |
| <b>*1876</b> | 2'8742                 | - '0002                        | 2619'1                 | - '18                          | 258'03                 | 1'7                 | 3'378                 | 2'63                 |  |
| <b>1877</b>  | 2'9453                 | - '0002                        | 2984'4                 | - '19                          | 225'22                 | 2'5                 | 2'801                 | 2'93                 |  |
| <b>1878</b>  | 0'4624                 | - '0001                        | 3346'3                 | - '18                          | 188'85                 | 365'0               | 2'196                 | 3'23                 |  |
| <b>1879</b>  | 1'5336                 | - '0001                        | 3711'7                 | - '10                          | 156'04                 | 0'6                 | 1'619                 | 3'52                 |  |
| <b>*1880</b> | 2'6052                 | ...                            | 4077'7                 | + '03                          | 123'23                 | 1'4                 | 1'043                 | 0'27                 |  |
| <b>1881</b>  | 2'6771                 | + '0001                        | 111'5                  | + '13                          | 90'41                  | 2'2                 | 0'466                 | 0'57                 |  |
| <b>1882</b>  | 0'1952                 | + '0001                        | 474'6                  | + '17                          | 54'05                  | 364'7               | 3'387                 | 0'87                 |  |
| <b>1883</b>  | 1'2674                 | + '0001                        | 841'3                  | + '14                          | 21'24                  | 0'2                 | 2'810                 | 1'17                 |  |
| <b>*1884</b> | 2'3395                 | + '0001                        | 1207'7                 | + '07                          | 387'31                 | 1'1                 | 2'234                 | 1'47                 |  |
| <b>1885</b>  | 2'4112                 | ...                            | 1573'9                 | - '01                          | 354'50                 | 1'9                 | 1'657                 | 1'77                 |  |
| <b>1886</b>  | 3'4828                 | - '0001                        | 1939'8                 | - '08                          | 321'68                 | 2'7                 | 1'081                 | 2'07                 |  |
| <b>1887</b>  | 1'0000                 | - '0001                        | 2301'9                 | - '11                          | 285'32                 | 365'2               | 0'476                 | 2'37                 |  |
| <b>*1888</b> | 2'0714                 | - '0001                        | 2667'6                 | - '10                          | 252'50                 | 0'8                 | 3'425                 | 2'67                 |  |
| <b>1889</b>  | 2'1429                 | ...                            | 3033'3                 | - '06                          | 219'69                 | 1'6                 | 2'848                 | 2'97                 |  |
| <b>1890</b>  | 3'2145                 | ...                            | 3399'3                 | + '03                          | 186'88                 | 2'4                 | 2'272                 | 3'27                 |  |
| <b>1891</b>  | 0'7323                 | + '0001                        | 3762'1                 | + '10                          | 150'51                 | 364'9               | 1'666                 | 0'02                 |  |
| <b>*1892</b> | 1'8044                 | + '0001                        | 4128'6                 | + '11                          | 117'70                 | 0'5                 | 1'090                 | 0'32                 |  |
| <b>1893</b>  | 1'8764                 | + '0001                        | 162'5                  | + '11                          | 84'89                  | 1'3                 | 0'513                 | 0'62                 |  |
| <b>1894</b>  | 2'9484                 | + '0001                        | 528'9                  | + '08                          | 52'08                  | 2'1                 | 3'462                 | 0'92                 |  |
| <b>1895</b>  | 0'4662                 | ...                            | 891'7                  | + '01                          | 15'71                  | 364'6               | 2'857                 | 1'21                 |  |
| <b>*1896</b> | 1'5378                 | ...                            | 1257'6                 | - '04                          | 381'78                 | 0'1                 | 2'281                 | 1'51                 |  |
| <b>1897</b>  | 1'6093                 | - '0001                        | 1623'5                 | - '08                          | 348'97                 | 1'0                 | 1'704                 | 1'81                 |  |
| <b>1898</b>  | 2'6807                 | - '0001                        | 1989'2                 | - '10                          | 316'16                 | 1'8                 | 1'128                 | 2'11                 |  |
| <b>1899</b>  | 0'1981                 | - '0001                        | 2351'4                 | - '07                          | 279'79                 | 364'3               | 0'523                 | 2'41                 |  |
| <b>1900</b>  | 1'2696                 | ...                            | 2717'3                 | - '01                          | 246'98                 | 365'1               | 3'471                 | 2'71                 |  |
| Period       | 3'5541                 | ...                            | 4332'6                 | ...                            | 398'88                 | 365'3               | 3'525                 | 3'55                 |  |

# SATELLITE II

## Approximate Tables of Conjunction

*I continued*

Epochs of Conjunction

|              |           | 3                                 | 4                     | 5                                 | 6                      | 7        | 8        | 9                    |  |
|--------------|-----------|-----------------------------------|-----------------------|-----------------------------------|------------------------|----------|----------|----------------------|--|
| Ye           | Co juncti | Var ation<br>for 100 <sup>d</sup> | $\alpha$              | Var ation<br>for 100 <sup>d</sup> | $\beta$                | $\gamma$ | $\delta$ |                      |  |
| <b>1900</b>  | 1 2696    |                                   | <sup>d</sup><br>717 3 | - 01                              | <sup>d</sup><br>246 98 | 365 1    | 3 471    | <sup>d</sup><br>2 71 | The constant - 0 <sup>d</sup> 1000<br>has been applied to<br>each entry in column  |
| <b>1901</b>  | 2 3414    |                                   | 3 83 4                | + 06                              | 14 17                  | 0 7      | 895      | 3 1                  |  |
| <b>1902</b>  | 3 4133    | + 001                             | 3449 8                | + 07                              | 181 35                 | 1 5      | 2 319    | 3 31                 |  |
| <b>1903</b>  | 9311      |                                   | 381 5                 | + 03                              | 144 99                 | 364      | 1 713    | 0 06                 | Th constant - 0 <sup>d</sup> 080<br>has been apl ed to<br>each entry i colu s<br>8 9   |
| <b>*1904</b> | 2 0 28    |                                   | 4178 6                | - 01                              | 11 18                  | 364 8    | 1 137    | 0 36                 |  |
| <b>1905</b>  | 0744      |                                   | 1                     | - 4                               | 79 36                  | 0 3      | 0 560    | 0 66                 |  |
| <b>1906</b>  | 3 1459    |                                   | 577 8                 | - 06                              | 46 55                  | 1 2      | 3 509    | 0 96                 | Fo Eclipses the argu<br>ment $\gamma$ is not wanted  |
| <b>1907</b>  | 0 6634    |                                   | 940                   | - 04                              | 10 19                  | 363 7    | 2 904    | 1 5                  |  |
| <b>1908</b>  | 1 735     |                                   | 1306 1                | - 01                              | 376 26                 | 364 5    | 2 3 8    | 1 55                 |  |
| <b>1909</b>  | 1 8 67    |                                   | 167                   | 0                                 | 343 45                 |          | 1 751    | 1 85                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1910</b>  | 2 8784    |                                   | 38 3                  | + 03                              | 310 63                 | 0 9      | 1 175    | 15                   |  |
| <b>1911</b>  | 396       |                                   | 401 0                 | + 04                              | 274 7                  | 363 4    | 0 569    | 45                   |  |
| <b>1912</b>  | 1 4679    |                                   | 767                   | + 03                              | 41 46                  | 364 2    | 3 518    | 75                   | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1913</b>  | 1 5397    |                                   | 3133 3                | + 01                              | 08 64                  | 365      | 2 942    | 3 05                 |  |
| <b>1914</b>  | 2 6114    |                                   | 3499 4                | 03                                | 175 83                 | 0 5      | 365      | 3 35                 |  |
| <b>1915</b>  | 0 1 89    |                                   | 3861 7                | - 6                               | 139 46                 | 363 1    | 1 760    | 0 10                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1916</b>  | 1 4       | - 0001                            | 4 7 6                 | - 07                              | 106 65                 | 363 9    | 1 184    | 0 40                 |  |
| <b>1917</b>  | 1 719     |                                   | 260 8                 | - 04                              | 73 84                  | 364 7    | 0 607    | 0 70                 |  |
| <b>1918</b>  | 3436      |                                   | 6 6 8                 | + 01                              | 41 03                  | 0 2      | 0 031    | 1 00                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1919</b>  | 3 4153    |                                   | 993 0                 | + 04                              | 8 2                    | 1 1      | 980      | 1 30                 |  |
| <b>1920</b>  | 0 9331    | + 00 1                            | 1355 7                | + 07                              | 370 73                 | 363 6    | 374      | 1 59                 |  |
| <b>1921</b>  | 1 0050    | + 00 1                            | 17 2 1                | + 1                               | 337 9                  | 364 4    | 1 798    | 1 89                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1922</b>  | 0771      |                                   | 088 6                 | 00                                | 305 11                 | 365      | 1 1      | 19                   |  |
| <b>1923</b>  | 3 1484    | - 0001                            | 2454 2                | - 7                               | 7 30                   | 8        | 0 645    | 2 49                 |  |
| <b>*1924</b> | 666       | - 0 1                             | 816 7                 | - 11                              | 35 93                  | 363 3    | 0 04     | 79                   | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1925</b>  | 0 7371    | - 000                             | 318 0                 | - 20                              | 03 1                   | 364 1    | 2 989    | 3 09                 |  |
| <b>1926</b>  | 1 8 81    | - 000                             | 3547 3                | - 0                               | 170 31                 | 364 9    | 2 41     | 3 39                 |  |
| <b>1927</b>  | 2 8793    | - 0001                            | 3912 7                | - 14                              | 137 49                 | 4        | 1 836    | 0 14                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1928</b>  | 0 3966    |                                   | 4 74 9                | - 03                              | 101 13                 | 363 0    | 1 231    | 0 44                 |  |
| <b>1929</b>  | 0 4684    | + 0001                            | 308 5                 | + 1                               | 68 32                  | 363 8    | 654      | 0 74                 |  |
| <b>1930</b>  | 1 54 6    | + 000                             | 675 1                 | + 18                              | 35 50                  | 364 6    | 0 078    | 1 04                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1931</b>  | 61 9      | + 0002                            | 1041 9                | + 19                              | 69                     | 0 1      | 3 027    | 1 34                 |  |
| <b>*1932</b> | 0 1311    | + 0 01                            | 1405 1                | + 18                              | 365 21                 | 362 7    | 4 1      | 1 63                 |  |
| <b>1933</b>  | 0 033     | + 0001                            | 1771 8                | + 11                              | 332 40                 | 363 5    | 1 845    | 1 93                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1934</b>  | 1 75      |                                   | 138 1                 | 00                                | 299 58                 | 364 3    | 1 68     | 23                   |  |
| <b>1935</b>  | 2 3467    | - 0001                            | 5 3 9                 | - 11                              | 266 77                 | 365 1    | 0 692    | 2 53                 |  |
| <b>1936</b>  | 3 4179    | - 000                             | 2869 4                | - 19                              | 33 96                  | 0 7      | 0 116    | 83                   | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1937</b>  | 3 4890    | - 0002                            | 3234 7                | - 21                              | 201 14                 | 1 5      | 3 065    | 3 13                 |  |
| <b>1938</b>  | 1 0 59    | - 0001                            | 3596 4                | - 17                              | 164 78                 | 364 0    | 2 459    | 3 43                 |  |
| <b>1939</b>  | 773       | - 0001                            | 3962 1                | - 07                              | 131 91                 | 364 8    | 1 883    | 0 18                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1940</b>  | 3 1489    |                                   | 4328 0                | + 04                              | 99 16                  | 0 3      | 1 306    | 0 48                 |  |
| <b>1941</b>  | 3 2 9     | + 0001                            | 361 9                 | + 14                              | 66 34                  | 1 2      | 0 730    | 0 78                 |  |
| <b>1942</b>  | 0 7390    | + 0001                            | 7 5                   | + 15                              | 9 98                   | 363 7    | 0 125    | 1 08                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1943</b>  | 1 8111    | + 0001                            | 1091 6                | + 11                              | 396 05                 | 364 5    | 3 073    | 1 38                 |  |
| <b>*1944</b> | 2 8831    |                                   | 1458 0                | + 04                              | 363 4                  | 0        | 2 497    | 1 68                 |  |
| <b>1945</b>  | 9548      |                                   | 18 4 0                | - 03                              | 330 43                 | 0 8      | 1 9 0    | 1 98                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1946</b>  | 0 47      | - 0 01                            | 2186 4                | - 08                              | 294 6                  | 363 4    | 1 315    | 2 8                  |  |
| <b>1947</b>  | 1 5436    | - 0 1                             | 255                   | - 10                              | 261 5                  | 364 2    | 0 739    | 2 58                 |  |
| <b>1948</b>  | 6150      | - 0001                            | 2917 8                | - 07                              | 28 43                  | 365 0    | 16       | 2 88                 | Column corrected by<br>the equatio s f om the<br>following tables gives<br>superior conjunctions<br>required for I clpses<br>and Occultations To<br>find inferior conjunc<br>tion for Shadows and<br>Transits add (or sub<br>t act) one half the<br>synodic period $e$<br>1 <sup>d</sup> 7770 to the num<br>bers of columns 2 4<br>6 7 8 9 |
| <b>1949</b>  | 6866      |                                   | 3 83 7                | - 3                               | 195 62                 | 0 5      | 3 111    | 3 18                 |  |
| <b>1950</b>  | 0 204     |                                   | 3646 2                | + 04                              | 159 26                 | 363 1    | 506      | 3 47                 |  |
| Pe od        | 3 5541    |                                   | 4332 6                |                                   | 398 88                 | 365 3    | 3 5 5    | 3 55                 |  |

# SATELLITE II

## Approximate Tables of Conjunction

*I continued*

Epochs of Conjunction

| 1            | 2                       | 3                              | 4                      | 5                              | 6                      | 7                     | 8                      | 9                    |   |
|--------------|-------------------------|--------------------------------|------------------------|--------------------------------|------------------------|-----------------------|------------------------|----------------------|---|
| Year         | Conjunction             | Variation for 100 <sup>d</sup> | $\alpha$               | Variation for 100 <sup>d</sup> | $\beta$                | $\gamma$              | $\delta$               | $\epsilon$           |   |
| <b>1950</b>  | <sup>d</sup><br>0°20'42 | ...                            | <sup>d</sup><br>3646.2 | + .04                          | <sup>d</sup><br>159°26 | <sup>d</sup><br>363°1 | <sup>d</sup><br>2°50'6 | <sup>d</sup><br>3°47 |   |
| <b>1951</b>  | 1°27'61                 | + .0001                        | 4012.6                 | + .08                          | 126°44                 | 363°9                 | 1°9'31                 | 0°22                 | The constant $-0^d.1000$ has been applied to each entry in column 2.  |
| <b>*1952</b> | 2°34'81                 | + .0001                        | 46.3                   | + .10                          | 93°63                  | 364°7                 | 1°35'3                 | 0°52                 |   |
| <b>1953</b>  | 2°42'01                 | + .0001                        | 412.8                  | + .08                          | 60°82                  | 0°2                   | 0°77'7                 | 0°82                 |   |
| <b>1954</b>  | 3°49'20                 | ...                            | 779.1                  | + .04                          | 28°00                  | 1°1                   | 0°20'0                 | 1°12                 |   |
| <b>1955</b>  | 1°00'97                 | ...                            | 1141.7                 | .00                            | 390°53                 | 363°6                 | 3°12'0                 | 1°42                 |   |
| <b>*1956</b> | 2°08'13                 | ...                            | 1507.7                 | - .04                          | 357°71                 | 364°4                 | 2°54'4                 | 1°72                 | The constant $-0^d.080$ has been applied to each entry in columns 8, 9.   |
| <b>1957</b>  | 2°15'28                 | - .0001                        | 1873.6                 | - .08                          | 324°90                 | 365°2                 | 1°96'7                 | 2°02                 |   |
| <b>1958</b>  | 3°22'42                 | - .0001                        | 2239.2                 | - .08                          | 292°09                 | 0°7                   | 1°39'1                 | 2°32                 |   |
| <b>1959</b>  | 0°74'16                 | ...                            | 2601.5                 | - .03                          | 255°72                 | 363°3                 | 0°78'6                 | 2°62                 |   |
| <b>*1960</b> | 1°81'33                 | ...                            | 2967.6                 | + .03                          | 222°91                 | 364°1                 | 0°20'9                 | 2°92                 |   |
| <b>1961</b>  | 1°88'52                 | ...                            | 3333.9                 | + .06                          | 190°10                 | 364°9                 | 3°15'8                 | 3°22                 | Column 2 corrected by the equations from the following tables, gives superior conjunction as required for Eclipses and Occultations. To find inferior conjunction for Shadows and Transits, add (or subtract) one half the synodic period, i.e. 1 <sup>d</sup> .7770, to the numbers of columns 2, 4, 6, 7, 8, 9. |
| <b>1962</b>  | 2°95'70                 | ...                            | 3700.2                 | + .04                          | 157°29                 | 0°4                   | 2°58'2                 | 3°51                 |   |
| <b>1963</b>  | 0°47'47                 | ...                            | 4062.8                 | .00                            | 120°92                 | 363°0                 | 1°97'6                 | 0°26                 |   |
| <b>*1964</b> | 1°54'63                 | ...                            | 96.2                   | - .04                          | 88°11                  | 363°8                 | 1°40'0                 | 0°56                 |   |
| <b>1965</b>  | 1°61'79                 | ...                            | 462.1                  | - .06                          | 55°30                  | 364°6                 | 0°82'3                 | 0°86                 |   |
| <b>1966</b>  | 2°68'94                 | ...                            | 828.0                  | - .03                          | 22°48                  | 0°1                   | 0°24'6                 | 1°16                 |   |
| <b>1967</b>  | 0°20'70                 | ...                            | 1190.5                 | - .04                          | 385°00                 | 362°7                 | 3°16'7                 | 1°46                 |   |
| <b>*1968</b> | 1°27'85                 | ...                            | 1556.3                 | - .03                          | 352°19                 | 363°5                 | 2°59'1                 | 1°76                 |   |
| <b>1969</b>  | 1°35'02                 | ...                            | 1922.5                 | + .04                          | 319°38                 | 364°3                 | 2°01'4                 | 2°06                 |   |
| <b>1970</b>  | 2°42'21                 | + .0001                        | 2288.7                 | + .06                          | 286°56                 | 365°1                 | 1°43'8                 | 2°36                 |   |
| <b>1971</b>  | 3°49'40                 | ...                            | 2655.0                 | + .04                          | 253°75                 | 0°6                   | 0°86'2                 | 2°66                 |   |
| <b>*1972</b> | 1°01'17                 | ...                            | 3017.6                 | + .03                          | 217°39                 | 363°2                 | 0°25'6                 | 2°96                 |   |
| <b>1973</b>  | 1°08'34                 | ...                            | 3383.8                 | - .01                          | 184°57                 | 364°0                 | 3°20'5                 | 3°26                 |   |
| <b>1974</b>  | 2°15'50                 | - .0001                        | 3749.7                 | - .07                          | 151°76                 | 364°8                 | 2°62'9                 | 0°01                 |   |
| <b>1975</b>  | 3°22'64                 | - .0001                        | 4115.4                 | - .07                          | 118°95                 | 0°3                   | 2°05'2                 | 0°31                 |   |
| <b>*1976</b> | 0°74'39                 | ...                            | 145.1                  | + .03                          | 82°58                  | 362°9                 | 1°44'7                 | 0°60                 |   |
| <b>1977</b>  | 0°81'59                 | ...                            | 511.6                  | - .04                          | 49°77                  | 363°7                 | 0°87'0                 | 0°90                 |   |
| <b>1978</b>  | 1°88'70                 | - .0001                        | 877.0                  | - .08                          | 16°96                  | 364°5                 | 0°29'4                 | 1°20                 |   |
| <b>1979</b>  | 2°95'88                 | + .0001                        | 1243.2                 | + .07                          | 383°03                 | 0°0                   | 3°24'3                 | 1°50                 |   |
| <b>*1980</b> | 0°47'67                 | + .0001                        | 1606.1                 | + .11                          | 346°66                 | 362°5                 | 2°63'8                 | 1°80                 |   |
| <b>1981</b>  | 0°54'87                 | + .0001                        | 1972.5                 | + .10                          | 313°85                 | 363°4                 | 2°06'1                 | 2°10                 |   |
| <b>1982</b>  | 1°62'07                 | ...                            | 2338.9                 | + .03                          | 281°40                 | 364°2                 | 1°48'5                 | 2°40                 |   |
| <b>1983</b>  | 2°69'23                 | - .0001                        | 2704.9                 | - .10                          | 248°23                 | 365°0                 | 0°90'8                 | 2°70                 |   |
| <b>*1984</b> | 0°20'94                 | ...                            | 3066.8                 | - .04                          | 211°86                 | 362°2                 | 0°30'3                 | 3°00                 |   |
| <b>1985</b>  | 0°28'14                 | - .0002                        | 3432.2                 | - .21                          | 179°05                 | 363°1                 | 3°25'2                 | 3°30                 |   |
| <b>1986</b>  | 1°35'15                 | - .0003                        | 3797.4                 | - .34                          | 146°24                 | 363°9                 | 2°67'5                 | 0°05                 |   |
| <b>1987</b>  | 2°42'27                 | - .0001                        | 4162.7                 | - .11                          | 113°42                 | 364°7                 | 2°09'9                 | 0°35                 |   |
| <b>*1988</b> | 3°49'43                 | ...                            | 196.1                  | .00                            | 80°61                  | 0°2                   | 1°52'3                 | 0°64                 |   |
| <b>1989</b>  | 0°01'20                 | + .0001                        | 558.8                  | + .10                          | 44°25                  | 362°7                 | 0°91'7                 | 0°94                 |   |
| <b>1990</b>  | 1°08'41                 | + .0002                        | 925.4                  | + .18                          | 11°43                  | 363°6                 | 0°34'1                 | 1°24                 |   |
| <b>1991</b>  | 2°15'65                 | + .0002                        | 1292.3                 | + .20                          | 377°50                 | 364°4                 | 3°29'0                 | 1°54                 |   |
| <b>*1992</b> | 3°22'88                 | + .0001                        | 1659.0                 | + .17                          | 344°69                 | 365°2                 | 2°71'3                 | 1°84                 |   |
| <b>1993</b>  | 3°30'09                 | + .0001                        | 2025.6                 | + .08                          | 311°88                 | 0°7                   | 2°13'7                 | 2°14                 |   |
| <b>1994</b>  | 0°81'86                 | ...                            | 2388.2                 | - .03                          | 275°51                 | 363°3                 | 1°53'2                 | 2°44                 |   |
| <b>1995</b>  | 1°89'00                 | - .0001                        | 2754.0                 | - .14                          | 242°70                 | 364°1                 | 0°95'5                 | 2°74                 |   |
| <b>*1996</b> | 2°96'11                 | - .0002                        | 3119.4                 | - .20                          | 209°89                 | 364°9                 | 0°37'9                 | 3°04                 |   |
| <b>1997</b>  | 3°03'22                 | - .0002                        | 3484.6                 | - .20                          | 177°08                 | 0°4                   | 3°32'7                 | 3°34                 |   |
| <b>1998</b>  | 0°54'92                 | - .0001                        | 3846.4                 | - .16                          | 140°71                 | 363°0                 | 2°72'2                 | 0°09                 |   |
| <b>1999</b>  | 1°62'06                 | ...                            | 4212.1                 | - .06                          | 107°90                 | 363°8                 | 2°14'6                 | 0°39                 |   |
| <b>*2000</b> | 2°69'23                 | ...                            | 245.6                  | .00                            | 75°09                  | 364°6                 | 1°56'9                 | 0°69                 |   |
| Period       | 3°55'41                 | ...                            | 4332.6                 | ...                            | 398°88                 | 365°3                 | 3°52'5                 | 3°55                 |   |

# SATELLITE II

## Approximate Tables of Conjunction

II

Motions of the Arguments

| Syn Rev | Date     | 3        |         |          | 4    | 5 | Syn Rev | Date      | 3        |         |          | 4    | 5 |
|---------|----------|----------|---------|----------|------|---|---------|-----------|----------|---------|----------|------|---|
|         |          | $\alpha$ | $\beta$ | $\gamma$ |      |   |         |           | $\alpha$ | $\beta$ | $\gamma$ |      |   |
|         | d        |          |         |          |      | d |         | i         | a        |         |          |      |   |
| 1       | January  | 3 5541   | 3 55    | 0 9      | 0    |   | 53      | July      | 7 3670   | 188 37  | 1 517    | 0 15 |   |
| 2       |          | 7 08     | 7 11    | 0 57     | 0 1  |   | 54      |           | 109 11   | 191 9   | 1 546    | 0 16 |   |
| 3       |          | 1 66 3   | 10 66   | 0 086    | 0 01 |   | 55      |           | 14 475   | 195 48  | 1 575    | 0 16 |   |
| 4       |          | 14 164   | 14      | 0 115    | 0 01 |   | 56      |           | 18 0 93  | 199 03  | 1 6 3    | 0 16 |   |
| 5       |          | 17 7705  | 17 77   | 0 143    | 0 1  |   | 57      |           | 1 5834   | 2 2 58  | 1 63     | 0 17 |   |
| 6       |          | 1 3 46   | 1 3     | 0 17     | 0    |   | 58      |           | 5 1375   | 06 14   | 1 661    | 0 17 |   |
| 7       |          | 4 8787   | 4 88    | 0        |      |   | 59      |           | 28 6916  | 09 69   | 1 689    | 0 17 |   |
| 8       |          | 8 43 8   | 8 43    | 0 2 9    | 0 0  |   | 60      | August    | 1 457    | 13 25   | 1 716    | 17   |   |
| 9       |          | 31 9868  | 31 99   | 258      | 0 03 |   | 61      |           | 4 7997   | 216 80  | 1 746    | 0 18 |   |
| 10      | February | 4 5409   | 35 54   | 0 286    | 0 03 |   | 62      |           | 8 3538   | 220 35  | 1 775    | 0 18 |   |
| 11      |          | 8 950    | 39 1    | 0 315    | 0 03 |   | 63      |           | 11 9079  | 2 3 91  | 1 804    | 0 18 |   |
| 12      |          | 11 6491  | 4 65    | 0 344    | 0 03 |   | 64      |           | 15 46 0  | 7 46    | 1 83     | 0 19 |   |
| 13      |          | 15 03    | 46 2    | 0 37     | 0 04 |   | 65      |           | 19 0161  | 231 0   | 1 861    | 19   |   |
| 14      |          | 18 7573  | 49 76   | 0 4 1    | 0 4  |   | 66      |           | 2 570    | 34 57   | 1 890    | 0 19 |   |
| 15      |          | 3114     | 53 31   | 0 4 9    | 04   |   | 67      |           | 6 1243   | 38 1    | 1 918    | 0 20 |   |
| 16      |          | 25 8655  | 56 87   | 458      | 0 05 |   | 68      |           | 9 6784   | 41 68   | 1 947    | 0 20 |   |
| 17      | March    | 1 4196   | 60 4    | 0 487    | 0 05 |   | 69      | September | 2 325    | 245 3   | 1 976    | 0 20 |   |
| 18      |          | 4 9737   | 63 97   | 0 515    | 0 05 |   | 70      |           | 5 7866   | 248 79  | 2 004    | 0 20 |   |
| 19      |          | 8 5 78   | 67 53   | 0 544    | 0 6  |   | 71      |           | 9 3407   | 25 34   | 033      | 21   |   |
| 20      |          | 1 0819   | 71 08   | 0 573    | 0 6  |   | 72      |           | 12 8948  | 255 89  | 2 061    | 0 21 |   |
| 21      |          | 15 6360  | 74 64   | 0 601    | 0 6  |   | 73      |           | 16 4489  | 59 45   | 090      | 0 21 |   |
| 22      |          | 19 1901  | 78 19   | 0 630    | 0 06 |   | 74      |           | 20 0030  | 63 0    | 2 119    | 0 2  |   |
| 23      |          | 7442     | 81 74   | 0 659    | 0 07 |   | 75      |           | 23 5571  | 66 56   | 2 147    | 0 22 |   |
| 24      |          | 6 983    | 85 30   | 0 687    | 0 07 |   | 76      |           | 7 111    | 70 11   | 2 176    | 22   |   |
| 25      |          | 9 85 4   | 88 85   | 0 716    | 0 07 |   | 77      |           | 30 6653  | 73 67   | 2 05     | 0 2  |   |
| 26      | April    | 4064     | 9 41    | 0 744    | 0 8  |   | 78      | October   | 4 2193   | 77      | 233      | 23   |   |
| 27      |          | 5 96 5   | 95 96   | 773      | 0 08 |   | 79      |           | 7 7734   | 80 77   | 26       | 3    |   |
| 28      |          | 9 5146   | 99 51   | 0 80     | 08   |   | 80      |           | 11 3 75  | 84 33   | 2 290    | 0 3  |   |
| 29      |          | 13 687   | 103 07  | 0 830    | 0 8  |   | 81      |           | 14 8816  | 87 88   | 319      | 0 4  |   |
| 30      |          | 16 6 28  | 106 6   | 0 859    | 09   |   | 82      |           | 18 4357  | 291 44  | 348      | 0 24 |   |
| 31      |          | 0 1769   | 11 18   | 0 888    | 9    |   | 83      |           | 1 9898   | 294 99  | 376      | 0 24 |   |
| 32      |          | 3 7310   | 113 73  | 0 916    | 0 09 |   | 84      |           | 25 5439  | 98 54   | 405      | 0 24 |   |
| 33      |          | 7 85     | 117 9   | 945      | 0 10 |   | 85      |           | 9 980    | 302 10  | 2 434    | 0 5  |   |
| 34      |          | 30 839   | 1 84    | 973      | 10   |   | 86      | November  | 1 6521   | 305 65  | 2 462    | 0 5  |   |
| 35      | May      | 4 3933   | 1 4 39  | 1 0      | 0 10 |   | 87      |           | 5 2062   | 309 1   | 491      | 0 25 |   |
| 36      |          | 7 9474   | 1 7 95  | 1 031    | 0 1  |   | 88      |           | 8 7603   | 312 76  | 2 519    | 0 26 |   |
| 37      |          | 11 5 15  | 131 50  | 1 059    | 0 11 |   | 89      |           | 1 3144   | 316 31  | 548      | 0 26 |   |
| 38      |          | 15 556   | 135 06  | 1 088    | 0 11 |   | 90      |           | 15 8685  | 319 87  | 577      | 0 26 |   |
| 39      |          | 18 6 97  | 138 61  | 1 117    | 0 11 |   | 91      |           | 19 4 6   | 323 42  | 2 6 5    | 0 27 |   |
| 40      |          | 1638     | 14 16   | 1 145    | 0 12 |   | 92      |           | 2 9767   | 3 6 98  | 2 634    | 0 27 |   |
| 41      |          | 25 7179  | 145 7   | 1 174    | 0 12 |   | 93      |           | 6 5308   | 330 53  | 2 663    | 0 27 |   |
| 42      |          | 9 7      | 149 7   | 1        | 0 1  |   | 94      |           | 30 0849  | 334 08  | 2 691    | 0 7  |   |
| 43      | June     | 1 8 60   | 15 83   | 1 31     | 0 13 |   | 95      | December  | 3 6389   | 337 64  | 2 72     | 0 8  |   |
| 44      |          | 5 3801   | 156 38  | 1 260    | 0 13 |   | 96      |           | 7 1930   | 341 19  | 2 749    | 0 28 |   |
| 45      |          | 8 934    | 159 93  | 1 88     | 0 13 |   | 97      |           | 10 7471  | 344 75  | 777      | 0 28 |   |
| 46      |          | 1 4883   | 163 49  | 1 317    | 0 13 |   | 98      |           | 14 301   | 348 30  | 2 8 6    | 0 29 |   |
| 47      |          | 16 04 4  | 167 4   | 1 346    | 0 14 |   | 99      |           | 17 8553  | 351 86  | 2 834    | 0 29 |   |
| 48      |          | 19 5965  | 170 60  | 1 374    | 0 14 |   | 100     |           | 1 4 94   | 355 41  | 863      | 0 29 |   |
| 49      |          | 23 1506  | 174 15  | 1 4 3    | 14   |   | 101     |           | 24 9635  | 358 96  | 2 89     | 0 9  |   |
| 50      |          | 6 7047   | 177 7   | 1 43     | 0 15 |   | 102     |           | 8 5176   | 362 52  | 920      | 0 30 |   |
| 51      |          | 30 588   | 181 6   | 1 46     | 0 15 |   | 103     |           | 32 0717  | 366 07  | 2 949    | 0 3  |   |
| 52      | July     | 3 8129   | 184 81  | 1 489    | 15   |   |         |           |          |         |          |      |   |

# SATELLITE II

## Approximate Tables of Conjunction

III      Equation of Conjunction      Argument  $\alpha$       Ec., Oc., Sh., Tr.

| 1                 | 2                      | 3               | 1                    | 2                      | 3               | 1                    | 2                      | 3               | 1                    | 2                      | 3               | 1                    | 2                      | 3               |
|-------------------|------------------------|-----------------|----------------------|------------------------|-----------------|----------------------|------------------------|-----------------|----------------------|------------------------|-----------------|----------------------|------------------------|-----------------|
| $\alpha$          | Equation               | $\Delta_{10^4}$ | $\alpha$             | Equation               | $\Delta_{10^4}$ | $\alpha$             | Equation               | $\Delta_{10^4}$ | $\alpha$             | Equation               | $\Delta_{10^4}$ | $\alpha$             | Equation               | $\Delta_{10^4}$ |
| <sup>d</sup><br>0 | <sup>d</sup><br>0°0800 | +8,5            | <sup>d</sup><br>1000 | <sup>d</sup><br>0°1346 | +0,3            | <sup>d</sup><br>2000 | <sup>d</sup><br>0°0923 | -7,3            | <sup>d</sup><br>3000 | <sup>d</sup><br>0°0301 | -3,0            | <sup>d</sup><br>4000 | <sup>d</sup><br>0°0533 | +7,3            |
| 20                | 817                    | 8,5             | 1020                 | 1346                   | +0,3            | 2020                 | 908                    | 7,5             | 3020                 | 295                    | 3,0             | 4020                 | 548                    | 7,5             |
| 40                | 834                    | 8,3             | 1040                 | 1347                   | 0,0             | 2040                 | 893                    | 7,3             | 3040                 | 289                    | 3,0             | 4040                 | 563                    | 7,5             |
| 60                | 850                    | 8,3             | 1060                 | 1346                   | -0,3            | 2060                 | 879                    | 7,3             | 3060                 | 283                    | 2,8             | 4060                 | 578                    | 7,8             |
| 80                | 867                    | 8,5             | 1080                 | 1346                   | 0,3             | 2080                 | 864                    | 7,5             | 3080                 | 278                    | 2,3             | 4080                 | 594                    | 7,8             |
| 100               | 884                    | 8,3             | 1100                 | 1345                   | 0,8             | 2100                 | 849                    | 7,5             | 3100                 | 274                    | 2,0             | 4100                 | 609                    | 7,8             |
| 120               | 0°0900                 | +8,3            | 1120                 | 0°1343                 | -1,0            | 2120                 | 0°0834                 | -7,3            | 3120                 | 0°0270                 | -2,0            | 4120                 | 0°0625                 | +8,0            |
| 140               | 917                    | 8,3             | 1140                 | 1341                   | 1,0             | 2140                 | 820                    | 7,3             | 3140                 | 266                    | 1,8             | 4140                 | 641                    | 8,0             |
| 160               | 933                    | 8,0             | 1160                 | 1339                   | 1,3             | 2160                 | 805                    | 7,5             | 3160                 | 263                    | 1,5             | 4160                 | 657                    | 8,0             |
| 180               | 949                    | 8,0             | 1180                 | 1336                   | 1,5             | 2180                 | 790                    | 7,5             | 3180                 | 260                    | 1,3             | 4180                 | 673                    | 8,3             |
| 200               | 965                    | 8,0             | 1200                 | 1333                   | 1,8             | 2200                 | 775                    | 7,5             | 3200                 | 258                    | 1,0             | 4200                 | 690                    | 8,3             |
| 220               | 0°0981                 | +8,0            | 1220                 | 0°1329                 | -2,0            | 2220                 | 0°0760                 | -7,5            | 3220                 | 0°0256                 | -0,8            | 4220                 | 0°0706                 | +8,3            |
| 240               | 997                    | 7,8             | 1240                 | 1325                   | 2,3             | 2240                 | 745                    | 7,5             | 3240                 | 255                    | 0,5             | 4240                 | 723                    | 8,3             |
| 260               | 1012                   | 7,5             | 1260                 | 1320                   | 2,5             | 2260                 | 730                    | 7,3             | 3260                 | 254                    | 0,5             | 4260                 | 739                    | 8,3             |
| 280               | 1027                   | 7,5             | 1280                 | 1315                   | 2,8             | 2280                 | 716                    | 7,3             | 3280                 | 253                    | -0,3            | 4280                 | 756                    | 8,5             |
| 300               | 1042                   | 7,5             | 1300                 | 1309                   | 3,0             | 2300                 | 701                    | 7,5             | 3300                 | 253                    | +0,3            | 4300                 | 773                    | 8,3             |
| 320               | 0°1057                 | +7,5            | 1320                 | 0°1303                 | -3,0            | 2320                 | 0°0686                 | -7,3            | 3320                 | 0°0254                 | +0,5            | 4320                 | 0°0789                 | +8,3            |
| 340               | 1072                   | 7,3             | 1340                 | 1297                   | 3,3             | 2340                 | 672                    | 7,0             | 3340                 | 255                    | 0,5             | 4340                 | 806                    | 8,5             |
| 360               | 1086                   | 7,0             | 1360                 | 1290                   | 3,5             | 2360                 | 658                    | 7,3             | 3360                 | 256                    | 0,8             | 4360                 | 823                    | 8,5             |
| 380               | 1100                   | 7,0             | 1380                 | 1283                   | 3,5             | 2380                 | 643                    | 7,3             | 3380                 | 258                    | 1,0             | 4380                 | 840                    | 8,3             |
| 400               | 1114                   | 7,0             | 1400                 | 1276                   | 3,8             | 2400                 | 629                    | 7,0             | 3400                 | 260                    | 1,3             | 4400                 | 856                    | 8,3             |
| 420               | 0°1128                 | +6,8            | 1420                 | 0°1268                 | -4,0            | 2420                 | 0°0615                 | -7,0            | 3420                 | 0°0263                 | +1,5            | 4420                 | 0°0873                 | +8,5            |
| 440               | 1141                   | 6,5             | 1440                 | 1260                   | 4,3             | 2440                 | 601                    | 7,0             | 3440                 | 266                    | 1,8             | 4440                 | 890                    | 8,3             |
| 460               | 1154                   | 6,3             | 1460                 | 1251                   | 4,5             | 2460                 | 587                    | 7,0             | 3460                 | 270                    | 2,0             | 4460                 | 906                    | 8,3             |
| 480               | 1166                   | 6,0             | 1480                 | 1242                   | 4,5             | 2480                 | 573                    | 6,8             | 3480                 | 274                    | 2,3             | 4480                 | 923                    | 8,3             |
| 500               | 1178                   | 6,0             | 1500                 | 1233                   | 4,5             | 2500                 | 560                    | 6,8             | 3500                 | 279                    | 2,5             | 4500                 | 939                    | 8,0             |
| 520               | 0°1190                 | +5,8            | 1520                 | 0°1224                 | -4,8            | 2520                 | 0°0546                 | -6,8            | 3520                 | 0°0284                 | +2,8            | 4520                 | 0°0955                 | +8,0            |
| 540               | 1201                   | 5,5             | 1540                 | 1214                   | 5,0             | 2540                 | 533                    | 6,5             | 3540                 | 290                    | 3,0             | 4540                 | 971                    | 8,0             |
| 560               | 1212                   | 5,5             | 1560                 | 1204                   | 5,0             | 2560                 | 520                    | 6,5             | 3560                 | 296                    | 3,0             | 4560                 | 987                    | 7,8             |
| 580               | 1223                   | 5,5             | 1580                 | 1194                   | 5,3             | 2580                 | 507                    | 6,3             | 3580                 | 302                    | 3,3             | 4580                 | 1002                   | 7,8             |
| 600               | 1233                   | 5,0             | 1600                 | 1183                   | 5,5             | 2600                 | 495                    | 6,3             | 3600                 | 309                    | 3,8             | 4600                 | 1018                   | 7,8             |
| 620               | 0°1243                 | +5,0            | 1620                 | 0°1172                 | -5,5            | 2620                 | 0°0482                 | -6,3            | 3620                 | 0°0317                 | +4,0            | 4620                 | 0°1033                 | +7,5            |
| 640               | 1253                   | 4,8             | 1640                 | 1161                   | 5,8             | 2640                 | 470                    | 6,0             | 3640                 | 325                    | 4,0             | 4640                 | 1048                   | 7,5             |
| 660               | 1263                   | 4,3             | 1660                 | 1149                   | 6,0             | 2660                 | 458                    | 6,0             | 3660                 | 333                    | 4,3             | 4660                 | 1063                   | 7,3             |
| 680               | 1270                   | 4,0             | 1680                 | 1137                   | 6,0             | 2680                 | 446                    | 5,8             | 3680                 | 342                    | 4,5             | 4680                 | 1077                   | 7,3             |
| 700               | 1278                   | 4,0             | 1700                 | 1125                   | 6,0             | 2700                 | 435                    | 5,5             | 3700                 | 351                    | 4,5             | 4700                 | 1092                   | 7,3             |
| 720               | 0°1286                 | +3,8            | 1720                 | 0°1113                 | -6,0            | 2720                 | 0°0424                 | -5,5            | 3720                 | 0°0360                 | +4,8            | 4720                 | 0°1106                 | +6,8            |
| 740               | 1293                   | 3,5             | 1740                 | 1101                   | 6,3             | 2740                 | 413                    | 5,5             | 3740                 | 370                    | 5,3             | 4740                 | 1119                   | 6,8             |
| 760               | 1300                   | 3,3             | 1760                 | 1088                   | 6,5             | 2760                 | 402                    | 5,3             | 3760                 | 381                    | 5,5             | 4760                 | 1133                   | 6,3             |
| 780               | 1306                   | 3,0             | 1780                 | 1075                   | 6,5             | 2780                 | 392                    | 5,0             | 3780                 | 392                    | 5,5             | 4780                 | 1146                   | 6,3             |
| 800               | 1312                   | 3,0             | 1800                 | 1062                   | 6,5             | 2800                 | 382                    | 5,0             | 3800                 | 403                    | 5,5             | 4800                 | 1158                   | 6,3             |
| 820               | 0°1318                 | +2,8            | 1820                 | 0°1049                 | -6,8            | 2820                 | 0°0372                 | -4,8            | 3820                 | 0°0414                 | +5,8            | 4820                 | 0°1171                 | +6,3            |
| 840               | 1323                   | 2,3             | 1840                 | 1035                   | 6,8             | 2840                 | 363                    | 4,5             | 3840                 | 426                    | 6,0             | 4840                 | 1183                   | 5,8             |
| 860               | 1327                   | 2,0             | 1860                 | 1022                   | 6,8             | 2860                 | 354                    | 4,5             | 3860                 | 438                    | 6,3             | 4860                 | 1194                   | 5,5             |
| 880               | 1331                   | 2,0             | 1880                 | 1008                   | 7,0             | 2880                 | 345                    | 4,3             | 3880                 | 451                    | 6,5             | 4880                 | 1205                   | 5,5             |
| 900               | 1335                   | 1,8             | 1900                 | 994                    | 7,0             | 2900                 | 337                    | 4,0             | 3900                 | 464                    | 6,5             | 4900                 | 1216                   | 5,5             |
| 920               | 0°1338                 | +1,5            | 1920                 | 0°0980                 | -7,0            | 2920                 | 0°0329                 | -4,0            | 3920                 | 0°0477                 | +6,8            | 4920                 | 0°1227                 | +5,3            |
| 940               | 1341                   | 1,3             | 1940                 | 966                    | 7,0             | 2940                 | 321                    | 3,8             | 3940                 | 491                    | 7,0             | 4940                 | 1237                   | 5,0             |
| 960               | 1343                   | 1,0             | 1960                 | 952                    | 7,3             | 2960                 | 314                    | 3,5             | 3960                 | 505                    | 7,0             | 4960                 | 1247                   | 4,8             |
| 980               | 1345                   | 0,8             | 1980                 | 937                    | 7,3             | 2980                 | 307                    | 3,3             | 3980                 | 519                    | 7,0             | 4980                 | 1256                   | 4,5             |
| 1000              | 0°1346                 | +0,3            | 2000                 | 0°0923                 | -7,3            | 3000                 | 0°0301                 | -3,0            | 4000                 | 0°0533                 | +7,3            | 5000                 | 0°1266                 | +4,5            |

Added Constant: +0°0800.

The Equation of this Table to be applied to the entries in Columns 2, 8, 9 of Table I.

# SATELLITE II

## Approximate Tables of Conjunction

IV      Equation of Geocentric Conjunction      Argument  $\beta$       Oc, Tr

| $\beta$ | Equation | $\Delta_1$ | $\beta$ | Equation | $\Delta_1$ | $\beta$ | Equation | $\Delta_d$ | $\beta$ | Equation | $\Delta_d$ |
|---------|----------|------------|---------|----------|------------|---------|----------|------------|---------|----------|------------|
| 0       | -0030    | -10        | 100     | -01373   | +33        | 200     | -0092    | +145       | 300     | +00776   | +30        |
| 2       | 34       | 13         | 102     | 1366     | 35         | 202     | 63       | 143        | 302     | 78       | 5          |
| 4       | 385      | 13         | 104     | 1359     | 40         | 204     | 35       | 143        | 304     | 786      | 18         |
| 6       | 47       | 10         | 106     | 1350     | 45         | 206     | 06       | 145        | 306     | 789      | 13         |
| 8       | 469      | 08         | 108     | 1341     | 50         | 208     | 177      | 143        | 308     | 791      | 08         |
| 10      | 51       | 8          | 110     | 133      | 55         | 210     | 149      | 143        | 310     | 79       | +03        |
| 12      | -00552   | -09        | 112     | -01319   | +58        | 212     | -010     | +145       | 312     | +0079    | -03        |
| 14      | 593      | 03         | 114     | 1307     | 63         | 214     | 91       | 143        | 314     | 791      | 08         |
| 16      | 633      | 198        | 116     | 94       | 68         | 216     | 63       | 140        | 316     | 789      | 13         |
| 18      | 672      | 195        | 118     | 18       | 7          | 218     | 35       | 14         | 318     | 786      | 18         |
| 20      | 711      | 195        | 120     | 1266     | 73         | 220     | -0007    | 140        | 320     | 78       | 5          |
| 22      | -00750   | -190       | 122     | -01251   | +78        | 222     | +0001    | +138       | 322     | +00776   | -33        |
| 24      | 787      | 185        | 124     | 135      | 8          | 224     | 48       | 138        | 324     | 769      | 35         |
| 26      | 824      | 183        | 126     | 119      | 85         | 226     | 76       | 138        | 326     | 76       | 4          |
| 28      | 86       | 178        | 128     | 101      | 90         | 228     | 103      | 135        | 328     | 753      | 50         |
| 30      | 895      | 173        | 130     | 1183     | 90         | 230     | 130      | 135        | 330     | 74       | 55         |
| 32      | -00929   | -165       | 132     | -01165   | +93        | 232     | +00157   | +135       | 332     | +00731   | -60        |
| 34      | 961      | 16         | 134     | 1146     | 98         | 234     | 184      | 133        | 334     | 718      | 68         |
| 36      | 993      | 158        | 136     | 116      | 103        | 236     | 210      | 130        | 336     | 704      | 73         |
| 38      | 104      | 15         | 138     | 115      | 105        | 238     | 236      | 130        | 338     | 689      | 80         |
| 40      | 153      | 145        | 140     | 1084     | 105        | 240     | 6        | 128        | 340     | 672      | 88         |
| 42      | -01082   | -14        | 142     | -0163    | +18        | 242     | +0287    | +15        | 342     | +00654   | -93        |
| 44      | 1109     | 133        | 144     | 1041     | 113        | 244     | 31       | 125        | 344     | 635      | 98         |
| 46      | 1135     | 128        | 146     | 118      | 115        | 246     | 337      | 13         | 346     | 615      | 15         |
| 48      | 116      | 10         | 148     | 995      | 118        | 248     | 361      | 118        | 348     | 593      | 113        |
| 50      | 1183     | 113        | 150     | 971      | 10         | 250     | 384      | 119        | 350     | 57       | 118        |
| 52      | -105     | -108       | 152     | -00947   | +120       | 252     | +00408   | +118       | 352     | +00546   | -13        |
| 54      | 126      | 103        | 154     | 93       | 13         | 254     | 431      | 113        | 354     | 51       | 130        |
| 56      | 146      | 95         | 156     | 898      | 15         | 256     | 453      | 110        | 356     | 494      | 138        |
| 58      | 164      | 90         | 158     | 873      | 18         | 258     | 475      | 108        | 358     | 466      | 143        |
| 60      | 1282     | 83         | 160     | 847      | 130        | 260     | 496      | 105        | 360     | 437      | 148        |
| 62      | -01297   | -75        | 162     | -0081    | +130       | 262     | +00517   | +103       | 362     | +00407   | -153       |
| 64      | 1312     | 7          | 164     | 795      | 130        | 264     | 537      | 98         | 364     | 376      | 160        |
| 66      | 135      | 63         | 166     | 769      | 133        | 266     | 556      | 95         | 366     | 343      | 165        |
| 68      | 1337     | 58         | 168     | 742      | 135        | 268     | 575      | 93         | 368     | 310      | 170        |
| 70      | 1348     | 53         | 170     | 715      | 138        | 270     | 593      | 90         | 370     | 275      | 175        |
| 72      | -01358   | -45        | 172     | -00687   | +138       | 272     | +00611   | +88        | 372     | +00240   | -178       |
| 74      | 1366     | 38         | 174     | 66       | 135        | 274     | 68       | 83         | 374     | 04       | 183        |
| 76      | 1373     | 33         | 176     | 633      | 138        | 276     | 644      | 80         | 376     | 167      | 188        |
| 78      | 1379     | 8          | 178     | 605      | 14         | 278     | 660      | 75         | 378     | 129      | 193        |
| 80      | 384      | 3          | 180     | 577      | 140        | 280     | 674      | 70         | 380     | 90       | 198        |
| 82      | -1388    | -18        | 182     | -00549   | +140       | 282     | +00688   | +7         | 382     | +0050    | -00        |
| 84      | 391      | 1          | 184     | 51       | 14         | 284     | 7        | 65         | 384     | +0001    | 03         |
| 86      | 139      | 5          | 186     | 493      | 143        | 286     | 714      | 58         | 386     | -00031   | 205        |
| 88      | 1393     |            | 188     | 464      | 143        | 288     | 75       | 55         | 388     | 7        | 208        |
| 90      | 139      | +08        | 190     | 436      | 143        | 290     | 736      | 53         | 390     | 113      | 10         |
| 92      | -01390   | +13        | 192     | -00407   | +145       | 292     | +746     | +48        | 392     | -00155   | -210       |
| 94      | 1387     | 15         | 194     | 378      | 145        | 294     | 755      | 43         | 394     | 197      | 210        |
| 96      | 384      | 0          | 196     | 349      | 143        | 296     | 763      | 38         | 396     | 39       | 210        |
| 98      | 1379     | 8          | 198     | 31       | 143        | 298     | 770      | 33         | 398     | 81       | 210        |
| 100     | -1373    | +33        | 200     | -009     | +145       | 300     | +00776   | +30        | 400     | -00323   | -0         |

Appl lC t t oo Th Eq ti fT bl IV t l by th fT bl V VI gl th A IP ll p h l h m t b ppl d f  
O ult ti dT t t th t fth Cl m 8 g fT bl I d l g m t fT bl LXVI f mp tl g th ff t fJ pit ph



# SATELLITE II

## Approximate Tables of Conjunction

| V        |         | Equation of Geocentric Conjunction |                 |                 |                 |                 |                 |                 |                 |                 |                 | Arguments $\alpha, \beta$ |                  |                  |                  |                  |                  | Oc., Tr.         |                  |                  |                  |                  |
|----------|---------|------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| $\alpha$ | $\beta$ | 0 <sup>d</sup>                     | 10 <sup>d</sup> | 20 <sup>d</sup> | 30 <sup>d</sup> | 40 <sup>d</sup> | 50 <sup>d</sup> | 60 <sup>d</sup> | 70 <sup>d</sup> | 80 <sup>d</sup> | 90 <sup>d</sup> | 100 <sup>d</sup>          | 110 <sup>d</sup> | 120 <sup>d</sup> | 130 <sup>d</sup> | 140 <sup>d</sup> | 150 <sup>d</sup> | 160 <sup>d</sup> | 170 <sup>d</sup> | 180 <sup>d</sup> | 190 <sup>d</sup> | 200 <sup>d</sup> |
| 0        | 0       | 200                                | 188             | 176             | 166             | 157             | 150             | 145             | 142             | 141             | 143             | 146                       | 150              | 155              | 161              | 168              | 174              | 180              | 185              | 190              | 195              | 200              |
| 100      |         | 218                                | 206             | 193             | 181             | 170             | 161             | 153             | 148             | 144             | 143             | 143                       | 146              | 149              | 153              | 158              | 163              | 169              | 174              | 178              | 183              | 188              |
| 200      |         | 236                                | 223             | 210             | 197             | 184             | 173             | 163             | 155             | 148             | 144             | 142                       | 142              | 144              | 146              | 150              | 154              | 158              | 162              | 167              | 171              | 176              |
| 300      |         | 252                                | 240             | 227             | 213             | 199             | 185             | 173             | 162             | 154             | 147             | 142                       | 140              | 139              | 140              | 142              | 145              | 148              | 152              | 156              | 160              | 165              |
| 400      |         | 268                                | 256             | 243             | 229             | 213             | 198             | 184             | 171             | 160             | 151             | 144                       | 139              | 136              | 135              | 136              | 137              | 140              | 143              | 146              | 150              | 154              |
| 500      |         | 282                                | 272             | 259             | 244             | 228             | 211             | 195             | 180             | 167             | 155             | 146                       | 139              | 134              | 132              | 131              | 131              | 133              | 135              | 137              | 140              | 144              |
| 600      |         | 295                                | 286             | 273             | 258             | 241             | 224             | 206             | 190             | 174             | 161             | 150                       | 141              | 134              | 130              | 127              | 126              | 126              | 128              | 130              | 132              | 135              |
| 700      |         | 306                                | 297             | 285             | 271             | 254             | 236             | 218             | 200             | 183             | 167             | 154                       | 143              | 135              | 129              | 125              | 123              | 122              | 123              | 124              | 126              | 128              |
| 800      |         | 314                                | 307             | 296             | 282             | 266             | 248             | 228             | 209             | 191             | 175             | 160                       | 147              | 138              | 130              | 125              | 121              | 120              | 119              | 119              | 121              | 122              |
| 900      |         | 320                                | 315             | 305             | 292             | 276             | 258             | 239             | 219             | 200             | 182             | 166                       | 153              | 141              | 132              | 126              | 121              | 119              | 117              | 117              | 117              | 118              |
| 1000     |         | 323                                | 320             | 312             | 310             | 285             | 267             | 248             | 228             | 209             | 190             | 173                       | 159              | 146              | 136              | 129              | 123              | 119              | 117              | 116              | 115              | 116              |
| 1100     |         | 324                                | 322             | 316             | 305             | 292             | 275             | 256             | 237             | 217             | 199             | 181                       | 165              | 152              | 141              | 133              | 126              | 122              | 119              | 117              | 116              | 115              |
| 1200     |         | 323                                | 323             | 318             | 309             | 297             | 281             | 263             | 245             | 226             | 207             | 189                       | 173              | 159              | 148              | 139              | 131              | 125              | 122              | 119              | 117              | 116              |
| 1300     |         | 318                                | 320             | 317             | 310             | 299             | 286             | 269             | 252             | 233             | 215             | 198                       | 181              | 167              | 155              | 145              | 138              | 131              | 127              | 124              | 121              | 119              |
| 1400     |         | 311                                | 315             | 314             | 309             | 300             | 288             | 274             | 257             | 240             | 223             | 206                       | 190              | 176              | 164              | 154              | 145              | 138              | 133              | 129              | 126              | 124              |
| 1500     |         | 302                                | 307             | 308             | 306             | 299             | 289             | 277             | 262             | 246             | 230             | 214                       | 199              | 185              | 173              | 162              | 154              | 147              | 141              | 137              | 133              | 130              |
| 1600     |         | 291                                | 298             | 301             | 300             | 296             | 288             | 278             | 265             | 252             | 237             | 222                       | 208              | 194              | 183              | 172              | 163              | 156              | 150              | 145              | 141              | 138              |
| 1700     |         | 278                                | 286             | 291             | 292             | 290             | 285             | 277             | 267             | 256             | 243             | 230                       | 217              | 204              | 193              | 183              | 174              | 166              | 160              | 155              | 151              | 147              |
| 1800     |         | 263                                | 272             | 279             | 283             | 283             | 281             | 276             | 268             | 259             | 248             | 237                       | 225              | 214              | 203              | 194              | 185              | 177              | 171              | 166              | 161              | 157              |
| 1900     |         | 247                                | 257             | 266             | 271             | 274             | 274             | 272             | 267             | 260             | 252             | 243                       | 233              | 223              | 213              | 204              | 196              | 189              | 183              | 177              | 172              | 168              |
| 2000     |         | 230                                | 241             | 251             | 258             | 264             | 266             | 267             | 265             | 261             | 255             | 248                       | 240              | 231              | 223              | 215              | 208              | 201              | 195              | 189              | 184              | 179              |
| 2100     |         | 212                                | 224             | 235             | 244             | 252             | 257             | 260             | 261             | 260             | 257             | 252                       | 246              | 240              | 233              | 226              | 219              | 212              | 207              | 202              | 196              | 191              |
| 2200     |         | 194                                | 206             | 218             | 229             | 239             | 246             | 252             | 256             | 258             | 257             | 255                       | 252              | 247              | 242              | 236              | 230              | 224              | 219              | 214              | 209              | 204              |
| 2300     |         | 176                                | 188             | 201             | 213             | 225             | 235             | 244             | 250             | 254             | 257             | 257                       | 256              | 253              | 249              | 245              | 240              | 235              | 230              | 226              | 221              | 216              |
| 2400     |         | 159                                | 171             | 184             | 198             | 211             | 223             | 234             | 243             | 250             | 255             | 258                       | 259              | 258              | 256              | 253              | 249              | 245              | 241              | 237              | 232              | 228              |
| 2500     |         | 142                                | 154             | 167             | 182             | 196             | 210             | 223             | 235             | 245             | 252             | 257                       | 261              | 262              | 262              | 260              | 258              | 255              | 251              | 247              | 243              | 239              |
| 2600     |         | 127                                | 138             | 151             | 166             | 182             | 197             | 212             | 226             | 238             | 248             | 256                       | 261              | 265              | 266              | 266              | 265              | 263              | 260              | 257              | 253              | 250              |
| 2700     |         | 113                                | 123             | 136             | 151             | 168             | 184             | 201             | 217             | 231             | 243             | 253                       | 261              | 266              | 269              | 271              | 271              | 270              | 268              | 265              | 262              | 259              |
| 2800     |         | 101                                | 110             | 123             | 138             | 154             | 172             | 190             | 207             | 223             | 237             | 249                       | 259              | 266              | 271              | 274              | 275              | 275              | 274              | 272              | 270              | 267              |
| 2900     |         | 91                                 | 99              | 111             | 125             | 142             | 160             | 179             | 197             | 215             | 230             | 244                       | 256              | 264              | 271              | 275              | 278              | 279              | 279              | 278              | 276              | 274              |
| 3000     |         | 84                                 | 90              | 100             | 114             | 131             | 149             | 168             | 187             | 206             | 223             | 238                       | 251              | 261              | 269              | 275              | 279              | 281              | 282              | 282              | 281              | 279              |
| 3100     |         | 78                                 | 83              | 92              | 105             | 121             | 139             | 158             | 178             | 197             | 215             | 231                       | 246              | 257              | 266              | 273              | 278              | 282              | 283              | 284              | 284              | 283              |
| 3200     |         | 76                                 | 79              | 87              | 98              | 113             | 130             | 149             | 169             | 188             | 207             | 224                       | 239              | 252              | 262              | 270              | 276              | 280              | 283              | 284              | 285              | 285              |
| 3300     |         | 76                                 | 77              | 83              | 93              | 107             | 123             | 141             | 160             | 180             | 199             | 216                       | 232              | 245              | 257              | 265              | 272              | 277              | 280              | 283              | 284              | 285              |
| 3400     |         | 79                                 | 78              | 82              | 90              | 102             | 117             | 134             | 153             | 172             | 190             | 208                       | 224              | 238              | 250              | 259              | 267              | 273              | 277              | 280              | 282              | 283              |
| 3500     |         | 84                                 | 81              | 84              | 90              | 100             | 113             | 129             | 146             | 164             | 182             | 200                       | 216              | 230              | 242              | 252              | 260              | 267              | 271              | 275              | 278              | 280              |
| 3600     |         | 91                                 | 87              | 87              | 92              | 100             | 111             | 125             | 141             | 158             | 175             | 191                       | 207              | 221              | 233              | 244              | 252              | 259              | 264              | 268              | 272              | 274              |
| 3700     |         | 101                                | 96              | 94              | 96              | 102             | 111             | 123             | 137             | 152             | 168             | 183                       | 198              | 212              | 224              | 234              | 243              | 250              | 256              | 261              | 265              | 268              |
| 3800     |         | 113                                | 106             | 102             | 102             | 106             | 113             | 122             | 134             | 147             | 161             | 175                       | 189              | 202              | 214              | 224              | 233              | 241              | 247              | 252              | 256              | 259              |
| 3900     |         | 127                                | 119             | 113             | 111             | 112             | 116             | 123             | 132             | 143             | 155             | 168                       | 181              | 192              | 204              | 214              | 222              | 230              | 236              | 241              | 246              | 250              |
| 4000     |         | 142                                | 138             | 125             | 121             | 120             | 121             | 126             | 132             | 141             | 151             | 161                       | 172              | 183              | 193              | 203              | 211              | 219              | 225              | 230              | 235              | 240              |
| 4100     |         | 159                                | 148             | 139             | 133             | 129             | 128             | 130             | 133             | 139             | 147             | 156                       | 165              | 174              | 183              | 192              | 200              | 207              | 213              | 219              | 224              | 228              |
| 4200     |         | 176                                | 165             | 154             | 146             | 140             | 136             | 135             | 136             | 139             | 144             | 151                       | 158              | 166              | 173              | 181              | 188              | 195              | 201              | 207              | 212              | 217              |
| 4300     |         | 194                                | 182             | 171             | 161             | 152             | 146             | 142             | 140             | 141             | 143             | 147                       | 152              | 158              | 164              | 171              | 177              | 184              | 189              | 194              | 199              | 204              |
| 4400     |         | 212                                | 200             | 188             | 176             | 166             | 157             | 150             | 146             | 143             | 143             | 144                       | 147              | 151              | 156              | 162              | 166              | 172              | 177              | 182              | 187              | 192              |
| 4500     |         | 230                                | 218             | 205             | 192             | 180             | 169             | 159             | 152             | 147             | 144             | 143                       | 143              | 145              | 148              | 152              | 157              | 161              | 166              | 171              | 175              | 180              |

The unit in this Table equals 0<sup>d</sup>.0001.

Added Constant: +0<sup>d</sup>.0200.

The sign is positive.

The Equation of this Table to be added to that of Table IV.

# SATELLITE II

## Approximate Tables of Conjunction

*V continued*

Equation of Geocentric Conjunction

Arguments  $\alpha \beta$

Oc, Tr

| $\alpha \backslash \beta$ | 200 <sup>l</sup> 210 <sup>d</sup> 220 <sup>l</sup> | 230 <sup>l</sup> 240 <sup>l</sup> 250 <sup>l</sup> | 260 <sup>l</sup> 270 <sup>l</sup> 280 <sup>l</sup> | 290 <sup>d</sup> 300 <sup>l</sup> 310 <sup>l</sup> | 320 <sup>d</sup> 330 <sup>l</sup> 340 <sup>d</sup> | 350 <sup>d</sup> 360 <sup>l</sup> 370 <sup>d</sup> | 380 <sup>l</sup> 390 <sup>l</sup> 400 <sup>l</sup> |
|---------------------------|--|--|--|--|--|--|--|
| <b>0</b>                  | 05 I   | 215 I 7  | 33 39 245  | 50 255 257   | 59 58 255  | 50 24 233  | 2 3 211 199  |
| <b>100</b>                | 188 193 198  | 203 I 16   | 2 3 30 38  | 45 51 57   | 61 63 263  | 6 255 248  | 239 2 8 217  |
| <b>200</b>                | 176 181 186  | 191 198 5  | 13 I 30  | 39 247 255   | 61 66 69   | 269 67 6   | 255 245 234  |
| <b>300</b>                | 165 169 174  | 18 186 193   | 211 I  | 231 4 52   | 61 68 274  | 277 277 75   | 69 61 251  |
| <b>400</b>                | 154 158 163  | 168 175 18   | 191 2 I I  | 24 36 248  | 59 69 277  | 283 286 286  | 83 76 267  |
| <b>500</b>                | 144 48 152   | 158 164 171  | 18 191 02  | 15 29 43   | 56 68 79   | 87 93 295  | 294 289 281  |
| <b>600</b>                | 135 39 143   | 148 154 161  | 17 181 193   | 206 21 236   | 252 266 79   | 290 298 303  | 304 301 94   |
| <b>700</b>                | 1 8 131 134  | 139 145 15   | 161 171 184  | 198 13 30  | 46 262 77  | 91 301 308   | 311 310 305  |
| <b>800</b>                | 12 1 5 1 7   | 131 137 143  | 15 16 175  | 189 05 2   | 240 58 274   | 89 302 311   | 316 317 314  |
| <b>900</b>                | 118 1 0 122  | 1 5 13 136   | 144 154 166  | 180 197 14   | 233 52 70  | 286 300 311  | 318 3 1 32   |
| <b>1000</b>               | 1 6 117 18   | 121 1 5 13   | 137 147 158  | 17 188 06  | 5 44 63  | 81 297 309   | 318 323 323  |
| <b>1100</b>               | 115 1 5 1 6  | 118 1 1 1 6  | 13 141 15  | 165 18 198   | 217 36 56  | 75 91 305  | 316 322 3 4  |
| <b>1200</b>               | 116 116 116  | 1 7 119 3  | 1 8 136 146  | 158 173 189  | 08 227 47  | 66 284 299   | 311 319 323  |
| <b>1300</b>               | 119 118 117  | 118 119 1  | 1 6 13 141   | 15 166 181   | 199 18 38  | 257 275 91   | 304 313 319  |
| <b>1400</b>               | 1 4 1 1 1  | 1 0 120 1 2  | 125 130 138  | 147 159 174  | 190 208 7  | 246 64 81  | 94 305 312   |
| <b>1500</b>               | 13 1 8 1 6   | 1 4 1 4 124  | 1 6 130 135  | 143 154 167  | 182 198 216  | 234 52 268   | 283 295 303  |
| <b>1600</b>               | 38 135 13  | 13 128 1 8   | 1 8 131 135  | 141 149 160  | 173 188 05   | 2 2 239 255  | 270 283 92   |
| <b>1700</b>               | 147 143 140  | 137 135 133  | 132 133 135  | 139 146 155  | 166 178 193  | 09 5 240   | 255 68 79  |
| <b>1800</b>               | 157 153 149  | 146 142 39   | 137 37 137   | 139 144 150  | 159 169 18   | 195 210 225  | 39 253 64  |
| <b>1900</b>               | 168 163 159  | 155 151 147  | 44 142 14  | 140 14 146   | 15 161 171   | 18 195 209   | 223 236 48   |
| <b>2000</b>               | 179 175 17   | 166 161 156  | 15 148 145   | 143 143 144  | 147 153 161  | 170 181 193  | 206 19 31  |
| <b>2100</b>               | 191 87 18  | 177 17 166   | 161 155 151  | 147 144 143  | 143 146 151  | 158 167 177  | 189 01 213   |
| <b>2200</b>               | 4 199 194  | 189 193 177  | 170 164 157  | 151 146 143  | 141 140 143  | 147 153 16   | 17 183 195   |
| <b>2300</b>               | 16 211 6   | 2 1 194 188  | 180 173 165  | 157 150 144  | 139 136 135  | 137 141 147  | 155 166 177  |
| <b>2400</b>               | 28 2 3 18  | 213 6 199  | 191 18 173   | 164 155 146  | 139 133 1 9  | 128 1 9 133  | 140 149 160  |
| <b>2500</b>               | 239 35 30  | 4 18 1   | 2 192 18   | 171 16 150   | 140 131 125  | 1 1 120 1 1  | 126 134 143  |
| <b>2600</b>               | 50 46 241  | 35 29 2  | 13 203 191   | 179 167 154  | 14 131 1   | 115 111 111  | 113 119 128  |
| <b>2700</b>               | 59 55 25   | 246 40 32  | 23 13 01   | 188 174 159  | 145 132 121  | 11 105 10  | 103 107 114  |
| <b>2800</b>               | 67 64 60   | 55 249 4   | 233 223 10   | 196 181 166  | 150 135 121  | 11 101 95  | 94 96 10   |
| <b>2900</b>               | 74 27 68   | 264 58 51  | 243 3 0  | 05 189 173   | 156 139 123  | 110 99 91  | 87 88 92   |
| <b>3000</b>               | 279 77 75  | 71 266 259   | 51 41 28   | 214 198 180  | 16 144 1 7   | 112 99 90  | 83 82 84   |
| <b>3100</b>               | 83 8 8   | 77 7 66  | 258 49 37  | 06 188   | 170 151 13   | 115 101 89   | 81 78 79   |
| <b>3200</b>               | 85 284 83  | 28 77 27   | 265 255 244  | 3 14 197   | 178 158 139  | 1 1 105 92   | 82 77 76   |
| <b>3300</b>               | 85 85 284  | 8 80 75  | 69 261 251   | 38 2 05  | 186 167 147  | 128 111 97   | 86 79 76   |
| <b>3400</b>               | 83 84 84   | 83 81 78   | 73 65 56   | 44 230 213   | 195 176 156  | 137 119 104  | 91 83 78   |
| <b>3500</b>               | 8 281 8  | 8 81 279   | 74 269 60  | 250 236 2 1  | 204 185 166  | 147 129 113  | 99 89 83   |
| <b>3600</b>               | 74 76 78   | 79 79 78   | 75 70 263  | 254 43 9   | 13 195 177   | 158 140 1 3  | 109 98 91  |
| <b>3700</b>               | 68 7 72  | 74 75 75   | 73 210 65  | 58 48 35   | 1 205 188  | 170 15 136   | 1 1 109 10   |
| <b>3800</b>               | 59 63 66   | 268 7 271  | 7 69 65  | 60 5 4   | 2 9 15 199   | 183 166 150  | 135 1 112  |
| <b>3900</b>               | 250 54 57  | 60 63 265  | 66 66 64   | 61 55 47   | 37 2 5 211   | 196 180 165  | 15 137 126   |
| <b>4000</b>               | 40 44 48   | 251 55 58  | 6 6 6  | 61 57 51   | 244 234 2  | 09 195 18  | 166 153 141  |
| <b>4100</b>               | 8 33 37  | 4 246 25   | 54 57 58   | 59 58 255  | 49 242 33  | 222 10 196   | 183 170 158  |
| <b>4200</b>               | 17 21 6  | 231 236 241  | 245 50 53  | 56 257 57  | 54 25 43   | 34 224 21  | 00 187 175   |
| <b>4300</b>               | 204 2 9 14   | 19 5 30  | 36 4 47  | 5 55 57  | 58 56 52   | 246 38 8   | 217 05 193   |
| <b>4400</b>               | 19 197 0   | 07 13 20   | 6 33 40  | 247 253 57   | 60 61 260  | 257 51 43  | 34 2 3 211   |
| <b>4500</b>               | 180 185 190  | 195 202 9  | 216 4 33   | 241 249 256  | 61 265 67  | 266 263 258  | 50 4 29  |

Tl ti th T bl i l oo

Add C t t + oo

Th ig i p itl

Tl q tl ftli T bl t b ld dt th t fl bl IV

# SATELLITE II

## Approximate Tables of Conjunction

VI      Equation of Geocentric Conjunction      Arguments  $\beta, \gamma$       Oc., Tr.

| $\beta \backslash \gamma$ | 0 <sup>d</sup> | 20 <sup>d</sup> | 40 <sup>d</sup> | 60 <sup>d</sup> | 80 <sup>d</sup> | 100 <sup>d</sup> | 120 <sup>d</sup> | 140 <sup>d</sup> | 160 <sup>d</sup> | 180 <sup>d</sup> | 200 <sup>d</sup> | 220 <sup>d</sup> | 240 <sup>d</sup> | 260 <sup>d</sup> | 280 <sup>d</sup> | 300 <sup>d</sup> | 320 <sup>d</sup> | 340 <sup>d</sup> | 360 <sup>d</sup> | 380 <sup>d</sup> | 400 <sup>d</sup> |
|---------------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0 <sup>d</sup>            | 100            | 108             | 115             | 119             | 120             | 119              | 115              | 111              | 107              | 103              | 100              | 96               | 93               | 88               | 84               | 81               | 80               | 81               | 85               | 92               | 100              |
| 20                        | 85             | 94              | 103             | 111             | 117             | 120              | 120              | 119              | 116              | 113              | 110              | 107              | 102              | 97               | 91               | 84               | 79               | 75               | 75               | 79               | 85               |
| 40                        | 72             | 80              | 91              | 102             | 112             | 119              | 123              | 124              | 123              | 122              | 119              | 116              | 112              | 106              | 99               | 89               | 80               | 72               | 68               | 68               | 72               |
| 60                        | 62             | 69              | 80              | 93              | 105             | 116              | 123              | 127              | 128              | 128              | 126              | 124              | 120              | 114              | 106              | 96               | 84               | 73               | 64               | 60               | 62               |
| 80                        | 56             | 61              | 71              | 84              | 98              | 111              | 120              | 126              | 129              | 130              | 130              | 129              | 126              | 121              | 113              | 103              | 90               | 76               | 65               | 58               | 57               |
| 100                       | 56             | 58              | 66              | 78              | 91              | 104              | 115              | 122              | 127              | 129              | 130              | 130              | 129              | 125              | 119              | 109              | 97               | 83               | 70               | 60               | 56               |
| 120                       | 61             | 60              | 64              | 74              | 85              | 97               | 108              | 116              | 121              | 125              | 127              | 128              | 128              | 127              | 122              | 115              | 104              | 91               | 78               | 67               | 61               |
| 140                       | 70             | 66              | 67              | 73              | 81              | 91               | 100              | 108              | 114              | 118              | 121              | 123              | 124              | 125              | 123              | 118              | 111              | 100              | 89               | 78               | 70               |
| 160                       | 83             | 77              | 74              | 75              | 79              | 85               | 92               | 99               | 104              | 108              | 112              | 115              | 118              | 120              | 121              | 120              | 116              | 110              | 101              | 91               | 83               |
| 180                       | 98             | 90              | 84              | 80              | 79              | 82               | 85               | 90               | 94               | 98               | 101              | 105              | 109              | 113              | 116              | 119              | 120              | 118              | 113              | 106              | 98               |
| 200                       | 113            | 104             | 95              | 88              | 82              | 80               | 80               | 82               | 85               | 88               | 91               | 95               | 99               | 104              | 110              | 116              | 121              | 124              | 124              | 120              | 113              |
| 220                       | 127            | 118             | 108             | 97              | 87              | 81               | 77               | 76               | 77               | 79               | 82               | 85               | 89               | 95               | 102              | 111              | 120              | 127              | 131              | 131              | 126              |
| 240                       | 137            | 130             | 119             | 106             | 94              | 84               | 77               | 74               | 72               | 73               | 75               | 77               | 81               | 86               | 95               | 105              | 117              | 127              | 136              | 139              | 137              |
| 260                       | 143            | 138             | 128             | 115             | 101             | 89               | 80               | 74               | 71               | 70               | 70               | 72               | 75               | 79               | 87               | 98               | 111              | 124              | 136              | 142              | 143              |
| 280                       | 144            | 142             | 134             | 122             | 108             | 95               | 84               | 77               | 73               | 70               | 70               | 70               | 71               | 75               | 82               | 92               | 104              | 118              | 131              | 141              | 144              |
| 300                       | 140            | 141             | 136             | 126             | 114             | 102              | 91               | 83               | 78               | 74               | 72               | 71               | 71               | 73               | 78               | 86               | 97               | 110              | 123              | 134              | 140              |
| 320                       | 131            | 135             | 133             | 127             | 118             | 108              | 99               | 91               | 85               | 81               | 78               | 76               | 75               | 75               | 77               | 82               | 90               | 101              | 113              | 124              | 131              |
| 340                       | 119            | 125             | 127             | 125             | 121             | 114              | 107              | 100              | 95               | 90               | 87               | 84               | 81               | 79               | 79               | 80               | 84               | 92               | 101              | 111              | 119              |
| 360                       | 104            | 112             | 118             | 121             | 121             | 118              | 114              | 109              | 105              | 101              | 97               | 94               | 90               | 86               | 83               | 81               | 80               | 83               | 89               | 96               | 104              |
| 380                       | 89             | 98              | 106             | 113             | 118             | 120              | 119              | 117              | 114              | 111              | 108              | 104              | 100              | 95               | 89               | 83               | 79               | 77               | 78               | 82               | 89               |
| 400                       | 75             | 84              | 94              | 105             | 114             | 119              | 122              | 123              | 122              | 120              | 117              | 114              | 110              | 104              | 97               | 88               | 79               | 73               | 69               | 70               | 75               |

The unit in this Table equals 0<sup>d</sup>.0001.

Added Constant: 0<sup>d</sup>.0000.

The sign is positive.

The Equation of this Table to be added to that of Table IV.

# SATELLITE II

## Approximate Tables of Conjunction

VII

Equations of Conjunction

VIII

| $\delta$  | Equation               | $\Delta$ |
|-----------|------------------------|----------|
| <b>00</b> | <sup>d</sup><br>0 0150 | - 19     |
| <b>1</b>  | 131                    | 19       |
| <b>2</b>  | 1 3                    | 18       |
| <b>3</b>  | 96                     | 16       |
| <b>4</b>  | 81                     | 14       |
| <b>5</b>  | 68                     | 1        |
| <b>06</b> | 0 0057                 | - 9      |
| <b>7</b>  | 50                     | 6        |
| <b>8</b>  | 45                     | 3        |
| <b>9</b>  | 44                     | + 1      |
| <b>10</b> | 46                     | 4        |
| <b>11</b> | 0 005                  | + 8      |
| <b>2</b>  | 61                     | 10       |
| <b>3</b>  | 72                     | 13       |
| <b>4</b>  | 86                     | 15       |
| <b>5</b>  | 102                    | 17       |
| <b>16</b> | 0 0120                 | + 18     |
| <b>7</b>  | 138                    | 19       |
| <b>8</b>  | 157                    | 19       |
| <b>9</b>  | 176                    | 16       |
| <b>20</b> | 193                    | 17       |
| <b>21</b> | 0 0210                 | + 16     |
| <b>2</b>  | 225                    | 14       |
| <b>3</b>  | 37                     | 11       |
| <b>4</b>  | 46                     | 8        |
| <b>5</b>  | 53                     | 5        |
| <b>26</b> | 0 0256                 | + 1      |
| <b>7</b>  | 255                    | -        |
| <b>8</b>  | 52                     | 5        |
| <b>9</b>  | 245                    | 9        |
| <b>30</b> | 235                    | 11       |
| <b>31</b> | 0 0223                 | - 14     |
| <b>2</b>  | 08                     | 16       |
| <b>3</b>  | 191                    | 18       |
| <b>4</b>  | 173                    | 18       |
| <b>5</b>  | 155                    | 19       |
| <b>36</b> | 0 0136                 | - 19     |
| <b>7</b>  | 118                    | 18       |
| <b>8</b>  | 100                    | 17       |
| <b>9</b>  | 84                     | 15       |
| <b>40</b> | 71                     | 13       |
| <b>41</b> | 0 059                  | - 10     |
| <b>2</b>  | 51                     | 7        |
| <b>3</b>  | 46                     | 4        |
| <b>4</b>  | 44                     | - 1      |
| <b>5</b>  | 45                     | + 3      |
| <b>46</b> | 0 0050                 | + 7      |
| <b>7</b>  | 58                     | 10       |
| <b>8</b>  | 69                     | 12       |
| <b>9</b>  | 8                      | 15       |
| <b>50</b> | 0 0098                 | + 17     |

Ec, Oc, Sh, Tr

|           | Equation              |
|-----------|-----------------------|
| <b>00</b> | <sup>d</sup><br>0 050 |
| <b>1</b>  | 51                    |
| <b>2</b>  | 53                    |
| <b>3</b>  | 54                    |
| <b>4</b>  | 54                    |
| <b>5</b>  | 54                    |
| <b>06</b> | 0 0053                |
| <b>7</b>  | 5                     |
| <b>8</b>  | 51                    |
| <b>9</b>  | 50                    |
| <b>10</b> | 48                    |
| <b>11</b> | 0 0047                |
| <b>2</b>  | 46                    |
| <b>3</b>  | 46                    |
| <b>4</b>  | 46                    |
| <b>5</b>  | 47                    |
| <b>16</b> | 0 0048                |
| <b>7</b>  | 49                    |
| <b>8</b>  | 50                    |
| <b>9</b>  | 52                    |
| <b>20</b> | 53                    |
| <b>21</b> | 0 0 54                |
| <b>2</b>  | 54                    |
| <b>3</b>  | 54                    |
| <b>4</b>  | 53                    |
| <b>5</b>  | 5                     |
| <b>26</b> | 0 0051                |
| <b>7</b>  | 50                    |
| <b>8</b>  | 48                    |
| <b>9</b>  | 47                    |
| <b>30</b> | 46                    |
| <b>31</b> | 0 0046                |
| <b>2</b>  | 46                    |
| <b>3</b>  | 47                    |
| <b>4</b>  | 48                    |
| <b>5</b>  | 49                    |
| <b>36</b> | 0 0051                |
| <b>7</b>  | 52                    |
| <b>8</b>  | 53                    |
| <b>9</b>  | 54                    |
| <b>40</b> | 54                    |
| <b>41</b> | 0 0054                |
| <b>2</b>  | 52                    |
| <b>3</b>  | 53                    |
| <b>4</b>  | 51                    |
| <b>5</b>  | 49                    |
| <b>46</b> | 0 0048                |
| <b>7</b>  | 47                    |
| <b>8</b>  | 46                    |
| <b>9</b>  | 46                    |
| <b>50</b> | 0 0046                |

Al d d C t t + s

Th Eq ti f T bl VII VIII t b dd dt th t f T bl I C l m

Add d C t t + 005



# SATELLITE II

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## Tables

of

Longitude on Jupiter's Orbit,  
Variation of the Radius Vector,  
and Latitude

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

IX Values at Epoch of Mean Longitude and the Arguments

| 1       | 2          | 3         | 4      | 5      | 6       | 7        | 8       | 9        | 10       | 11       | 12       | 13     | 14     |
|---------|------------|-----------|--------|--------|---------|----------|---------|----------|----------|----------|----------|--------|--------|
| Date    | Mean Long. | A         | B      | C      | D       | E        | F       | G        | H        | I        | J        | K      | L      |
| 1850.0  | 272°34315  | d 5°61104 | d 1°64 | d 0°12 | d 2°147 | d 0°5911 | d 0°247 | d 223°78 | d 451°85 | d 205°04 | d 253°48 | d 1°34 | d 2°03 |
| 1851.0  | 194°13116  | 3°96283   | 1°24   | 2°34   | 1°206   | 3°3459   | 3°020   | 187°62   | 359°18   | 87°74    | 132°89   | 0°12   | 3°18   |
| *1852.0 | 115°91917  | 2°31462   | 0°84   | 1°00   | 0°264   | 2°5493   | 2°242   | 151°46   | 266°50   | 452°74   | 12°30    | 0°66   | 0°84   |
| 1853.0  | 139°08194  | 1°66641   | 1°45   | 0°65   | 0°322   | 2°7528   | 2°463   | 116°31   | 174°83   | 336°44   | 378°30   | 0°44   | 2°99   |
| 1854.0  | 60°86995   | 0°01819   | 1°05   | 2°87   | 2°934   | 1°9562   | 1°685   | 80°15    | 82°15    | 219°14   | 257°71   | 0°98   | 0°65   |
| 1855.0  | 342°65796  | 5°42091   | 0°65   | 1°53   | 1°992   | 1°1596   | 0°906   | 43°99    | 447°15   | 101°83   | 137°12   | 1°53   | 1°81   |
| *1856.0 | 264°44597  | 3°77270   | 0°26   | 0°18   | 1°050   | 0°3630   | 0°128   | 7°84     | 354°48   | 466°83   | 16°53    | 0°31   | 2°96   |
| 1857.0  | 287°60875  | 3°12449   | 0°86   | 3°40   | 1°109   | 0°5664   | 0°350   | 373°84   | 262°80   | 350°53   | 382°53   | 0°08   | 1°62   |
| 1858.0  | 209°39676  | 1°47628   | 0°46   | 2°06   | 0°167   | 3°3212   | 3°123   | 337°68   | 170°13   | 233°23   | 261°95   | 0°63   | 2°77   |
| 1859.0  | 131°18477  | 6°87900   | 0°07   | 0°71   | 2°779   | 2°5246   | 2°344   | 301°52   | 77°45    | 115°93   | 141°35   | 1°17   | 0°43   |
| *1860.0 | 52°97278   | 5°23078   | 4°18   | 2°92   | 1°837   | 1°7280   | 1°566   | 265°37   | 442°45   | 480°93   | 20°76    | 1°71   | 1°58   |
| 1861.0  | 76°13555   | 4°58257   | 0°27   | 2°59   | 1°895   | 1°9314   | 1°788   | 230°21   | 350°78   | 364°63   | 386°76   | 1°49   | 0°24   |
| 1862.0  | 357°92356  | 2°93436   | 4°39   | 1°24   | 0°954   | 1°1348   | 1°009   | 194°05   | 258°10   | 247°33   | 266°17   | 0°27   | 1°39   |
| 1863.0  | 279°71157  | 1°28615   | 3°99   | 3°46   | 0°012   | 0°3382   | 0°231   | 157°89   | 165°43   | 130°02   | 145°58   | 0°81   | 2°54   |
| *1864.0 | 201°49958  | 6°68887   | 3°59   | 2°12   | 2°623   | 3°0930   | 3°004   | 121°74   | 72°75    | 12°72    | 24°99    | 1°36   | 0°20   |
| 1865.0  | 224°66235  | 6°04066   | 4°20   | 1°78   | 2°682   | 3°2964   | 3°225   | 86°58    | 438°75   | 378°72   | 390°99   | 1°13   | 2°36   |
| 1866.0  | 146°45036  | 4°39245   | 3°80   | 0°43   | 1°740   | 2°4998   | 2°447   | 50°42    | 346°08   | 261°42   | 270°40   | 1°68   | 0°01   |
| 1867.0  | 68°23837   | 2°74424   | 3°40   | 2°65   | 0°799   | 1°7033   | 1°669   | 14°27    | 253°40   | 144°12   | 149°81   | 0°46   | 1°17   |
| *1868.0 | 350°02038  | 1°09603   | 3°01   | 1°30   | 3°410   | 0°9067   | 0°890   | 379°27   | 160°73   | 26°82    | 29°22    | 1°00   | 2°32   |
| 1869.0  | 13°18915   | 0°44782   | 3°61   | 0°96   | 3°468   | 1°1101   | 1°112   | 344°11   | 69°06    | 392°82   | 395°22   | 0°78   | 0°98   |
| 1870.0  | 294°97716  | 5°85053   | 3°21   | 3°18   | 2°527   | 0°3135   | 0°334   | 307°95   | 434°06   | 275°51   | 274°63   | 1°32   | 2°13   |
| 1871.0  | 216°76517  | 4°20232   | 2°82   | 1°83   | 1°585   | 3°0683   | 3°106   | 271°80   | 341°38   | 158°21   | 154°04   | 0°10   | 3°28   |
| *1872.0 | 138°55319  | 2°55411   | 2°42   | 0°49   | 0°644   | 2°2717   | 2°328   | 235°64   | 248°71   | 40°91    | 33°45    | 0°64   | 0°94   |
| 1873.0  | 161°71596  | 1°90590   | 3°02   | 0°15   | 0°702   | 2°4751   | 2°550   | 200°48   | 157°03   | 406°91   | 399°45   | 0°42   | 3°09   |
| 1874.0  | 83°50397   | 0°25769   | 2°63   | 2°36   | 3°313   | 1°6785   | 1°771   | 164°33   | 64°36    | 289°61   | 278°86   | 0°97   | 0°75   |
| 1875.0  | 5°29198    | 5°66041   | 2°23   | 1°02   | 2°372   | 0°8819   | 0°993   | 128°17   | 429°36   | 172°31   | 158°27   | 1°51   | 1°91   |
| *1876.0 | 287°07999  | 4°01219   | 1°83   | 3°24   | 1°430   | 0°0853   | 0°215   | 92°01    | 336°68   | 55°00    | 37°68    | 0°29   | 3°06   |
| 1877.0  | 310°24276  | 3°36398   | 2°44   | 2°89   | 1°488   | 0°2887   | 0°436   | 56°85    | 245°01   | 421°00   | 403°68   | 0°06   | 1°72   |
| 1878.0  | 232°03077  | 1°71577   | 2°04   | 1°55   | 0°547   | 3°0435   | 3°209   | 20°70    | 152°33   | 303°70   | 283°09   | 0°61   | 2°87   |
| 1879.0  | 153°81878  | 0°06756   | 1°64   | 0°21   | 3°158   | 2°2469   | 2°431   | 385°70   | 59°66    | 186°40   | 162°51   | 1°15   | 0°53   |
| *1880.0 | 75°60679   | 5°47028   | 1°25   | 2°42   | 2°216   | 1°4504   | 1°652   | 349°54   | 424°66   | 69°10    | 41°92    | 1°70   | 1°68   |
| 1881.0  | 98°76956   | 4°82207   | 1°85   | 2°08   | 2°275   | 1°6538   | 1°874   | 314°38   | 332°98   | 435°10   | 407°92   | 1°47   | 0°34   |
| 1882.0  | 20°55757   | 3°17386   | 1°45   | 0°74   | 1°333   | 0°8572   | 1°096   | 278°23   | 240°31   | 317°80   | 287°33   | 0°25   | 1°49   |
| 1883.0  | 302°34558  | 1°52565   | 1°05   | 2°95   | 0°392   | 0°0606   | 0°317   | 242°07   | 147°63   | 200°49   | 166°74   | 0°80   | 2°64   |
| *1884.0 | 224°13359  | 6°92836   | 0°66   | 1°61   | 3°003   | 2°8154   | 3°090   | 205°91   | 54°96    | 83°19    | 46°15    | 1°34   | 0°30   |
| 1885.0  | 247°29637  | 6°28015   | 1°26   | 1°27   | 3°061   | 3°0188   | 3°312   | 170°76   | 420°96   | 449°19   | 412°15   | 1°12   | 2°46   |
| 1886.0  | 169°08438  | 4°63194   | 0°86   | 3°48   | 2°120   | 2°2222   | 2°534   | 134°60   | 328°28   | 331°89   | 291°56   | 1°66   | 0°11   |
| 1887.0  | 90°87239   | 2°98373   | 0°47   | 2°14   | 1°178   | 1°4256   | 1°755   | 98°44    | 235°61   | 214°59   | 170°97   | 0°44   | 1°27   |
| *1888.0 | 12°66040   | 1°33552   | 0°07   | 0°80   | 0°237   | 0°6290   | 0°977   | 62°29    | 142°93   | 97°29    | 50°38    | 0°98   | 2°42   |
| 1889.0  | 35°82317   | 0°68731   | 0°67   | 0°46   | 0°295   | 0°8324   | 1°198   | 27°13    | 51°26    | 463°29   | 416°38   | 0°76   | 1°08   |
| 1890.0  | 317°61118  | 6°09003   | 0°28   | 2°67   | 2°906   | 0°0358   | 0°420   | 392°13   | 416°26   | 345°99   | 295°79   | 1°30   | 2°23   |
| 1891.0  | 239°39919  | 4°44182   | 4°39   | 1°33   | 1°965   | 2°7906   | 3°193   | 355°97   | 323°58   | 228°68   | 175°20   | 0°08   | 3°38   |
| *1892.0 | 161°18720  | 2°79360   | 3°99   | 3°55   | 1°023   | 1°9940   | 2°415   | 319°82   | 230°91   | 111°38   | 54°61    | 0°63   | 1°04   |
| 1893.0  | 184°34997  | 2°14539   | 0°09   | 3°20   | 1°081   | 2°1974   | 2°636   | 284°66   | 139°23   | 477°38   | 420°61   | 0°40   | 3°19   |
| 1894.0  | 106°13798  | 0°49718   | 4°20   | 1°86   | 0°140   | 1°4009   | 1°858   | 248°50   | 46°56    | 360°08   | 300°02   | 0°95   | 0°85   |
| 1895.0  | 27°92599   | 5°89990   | 3°80   | 0°52   | 2°751   | 0°6043   | 1°080   | 212°34   | 411°56   | 242°78   | 179°43   | 1°49   | 2°01   |
| *1896.0 | 309°71400  | 4°25169   | 3°41   | 2°73   | 1°810   | 3°3591   | 0°301   | 176°19   | 318°88   | 125°48   | 58°84    | 0°27   | 3°16   |
| 1897.0  | 332°87677  | 3°60348   | 4°01   | 2°39   | 1°868   | 0°0111   | 0°523   | 141°03   | 227°21   | 9°17     | 424°84   | 0°05   | 1°82   |
| 1898.0  | 254°66478  | 1°95527   | 3°61   | 1°05   | 0°926   | 2°7659   | 3°296   | 104°87   | 134°53   | 374°17   | 304°25   | 0°59   | 2°97   |
| 1899.0  | 176°45280  | 0°30706   | 3°22   | 3°26   | 3°538   | 1°9693   | 2°517   | 68°72    | 41°86    | 256°87   | 183°66   | 1°13   | 0°63   |
| 1900.0  | 98°24081   | 5°70977   | 2°82   | 1°92   | 2°596   | 1°1727   | 1°739   | 32°56    | 406°86   | 139°57   | 63°07    | 1°68   | 1°78   |
| Periods | ...        | 7°05093   | 4°51   | 3°56   | 3°553   | 3°5514   | 3°551   | 401°16   | 457°67   | 482°30   | 485°59   | 1°77   | 3°50   |

Constant applied to each entry in Column 2:  $-1^{\circ}3000$ .

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

### IX Values at Epoch of Mean Longitude and the Arguments

| 5     | 6                   | 7    | 8       | 9       |        |       |                     | 3       | 4                 | 5                    | 6    | 7   | 8                   |
|-------|---------------------|------|---------|---------|--------|-------|---------------------|---------|-------------------|----------------------|------|-----|---------------------|
| M     | N                   | O    | P       | Q       | R      | S     | T                   | U       | V                 | W                    | X    | Y   | Z                   |
| 058   | <sup>d</sup><br>040 | 016  | 1850 0  | 3 13941 | 0 3167 | 0 71  | <sup>d</sup><br>095 | 1 04479 | <sup>1</sup><br>3 | <sup>d</sup><br>1 83 | 2 3  | 3 1 | <sup>d</sup><br>2 7 |
| 1 70  | 1 39                | 3 5  | 1851 0  | 36777   | 1 3794 | 1 7 6 | 18                  | 0 39122 | 9                 | 1 084                | 1 56 | 0 5 | 1 3                 |
| 083   | 39                  | 77   | 1852 0  | 1 59613 | 0 6668 | 967   | 1 19                | 3 8769  | 6                 | 0 338                | 0 79 | 1 4 | 3 5                 |
| 0595  | 088                 | 3 8  | 1853 0  | 1 8 448 | 0 954  | 1 08  | 1 42                | 0 08409 | 3 3               | 591                  | 1 03 | 3 2 | 3 1                 |
| 1 6 8 | 1 87                | 80   | 1854 0  | 1 05 84 | 0 416  | 0 449 | 0 65                | 2 98055 | 3 0               | 3 396                | 0 26 | 0 6 | 1 8                 |
| 62    | 87                  | 31   | 1855 0  | 0 81 0  | 1 3043 | 1 466 | 1 66                | 3 2698  | 7                 | 2 649                | 3 05 | 1 5 | 0 4                 |
| 0 133 | 0 36                | 1 83 | 1856 0  | 3 06074 | 0 5917 | 0 707 | 0 89                | 1 67341 | 2 4               | 1 9 3                | 28   | 3   | 6                   |
| 146   | 36                  | 34   | 1857 0  | 3 8909  | 0 8791 | 948   | 1 1                 | 0 1985  | 3 1               | 157                  | 51   | 0 7 | 2                   |
| 3 158 | 3 35                | 1 85 | 1858 0  | 51745   | 0 1665 | 0 189 | 0 35                | 1 36628 | 8                 | 1 410                | 1 75 | 1 6 | 0 8                 |
| 670   | 0 85                | 1 37 | 1859 0  | 1 74581 | 1 2 92 | 1 05  | 1 36                | 0 71 71 | 2 5               | 0 664                | 0 98 | 5   | 3 0                 |
| 1 683 | 1 84                | 0 88 | *1860 0 | 0 97417 | 0 5166 | 0 446 | 0 59                | 0 5914  | 3                 | 3 469                | 0 2  | 3 3 | 1 6                 |
| 0 195 | 0 34                | 1 4  | 1861 0  | 1 20 5  | 0 8040 | 0 687 | 0 8                 | 0 40557 | 3 0               | 0 171                | 0 45 | 1 7 | 1 3                 |
| 8     | 1 33                | 0 91 | 1862 0  | 0 43088 | 0 915  | 1 704 | 0 05                | 3 30 04 | 2 7               | 976                  | 3 24 | 2 6 | 3 5                 |
| 2 20  | 3                   | 43   | 1863 0  | 3 1 4   | 1 154  | 0 945 | 1 06                | 64847   | 2 4               | 2 30                 | 47   | 3 4 | 1                   |
| 3 3   | 3 3                 | 3 5  | 1864 0  | 43878   | 0 1416 | 0 186 | 0 29                | 1 99490 | 1                 | 1 483                | 1 71 | 0 8 | 0 7                 |
| 1 745 | 1 81                | 0 45 | 1865 0  | 66713   | 7 90   | 0 427 | 0 52                | 34133   | 8                 | 1 737                | 1 94 | 2 7 | 0 3                 |
| 2 757 | 8                   | 3 55 | 1866 0  | 1 89549 | 0 0164 | 1 443 | 1 53                | 1 68776 | 2 5               | 0 991                | 1 18 | 0 1 | 2 5                 |
| 0 70  | 0 30                | 3 07 | 1867 0  | 1 1 385 | 1 0791 | 0 684 | 0 76                | 1 03419 | 2 2               | 0 244                | 41   | 0 9 | 1 1                 |
| 1 83  | 1 30                | 58   | *1868 0 | 0 35 20 | 0 3665 | 1 701 | 1 77                | 0 38062 | 1 9               | 3 049                | 3 20 | 1 8 | 3 3                 |
| 3 295 | 3 29                | 3 9  | 1869 0  | 0 58056 | 0 6539 | 0 166 | 23                  | 0 72705 | 2 7               | 3 303                | 3 43 | 0 2 | 3 0                 |
| 0 808 | 0 79                | 2 61 | 1870 0  | 3 36010 | 1 7166 | 1 183 | 1 23                | 0 07348 | 2 4               | 2 556                | 67   | 1 0 | 1 6                 |
| 1 8 0 | 1 78                | 1    | 1871 0  | 58846   | 1 0040 | 0 424 | 0 46                | 2 96995 | 2 1               | 1 810                | 1 91 | 1 9 | 0 2                 |
| 83    | 2 78                | 1 64 | *1872 0 | 1 81681 | 0 2914 | 1 441 | 1 47                | 31638   | 1 8               | 1 064                | 1 14 | 2 8 | 4                   |
| 1 345 | 1 27                | 2 15 | 1873 0  | 04517   | 0 5788 | 1 68  | 1 69                | 66281   | 5                 | 1 317                | 1 37 | 1   | 2 0                 |
| 357   | 6                   | 1 66 | 1874 0  | 1 7353  | 1 6415 | 0 9 3 | 0 94                | 009 4   | 2 2               | 0 571                | 0 61 | 2 0 | 0 7                 |
| 3 369 | 3 6                 | 1 12 | 1875 0  | 0 5 189 | 0 9 89 | 0 164 | 17                  | 1 35567 | 1 9               | 3 376                | 3 39 | 2 9 | 2 8                 |
| 0 882 | 0 75                | 0 69 | *1876 0 | 3 814   | 0 2163 | 1 180 | 1 17                | 0 70 10 | 1 6               | 6 9                  | 63   | 0 3 | 1 5                 |
| 2 894 | 75                  | 1 1  | 1877 0  | 3 50978 | 0 5037 | 1 4 1 | 1 41                | 1 01854 | 3                 | 2 883                | 86   | 2   | 1 1                 |
| 0 4 7 | 0 24                | 0 7  | 1878 0  | 73814   | 1 5664 | 0 66  | 64                  | 0 39197 | 2 1               | 2 137                | 2 10 | 3 0 | 3 3                 |
| 1 420 | 1 24                | 0 24 | 1879 0  | 1 96650 | 0 8538 | 1 679 | 1 64                | 3 29143 | 1 8               | 1 390                | 1 33 | 0 4 | 1 9                 |
| 2 43  | 2 23                | 3 33 | *1880 0 | 1 19485 | 0 1412 | 0 920 | 0 88                | 63786   | 1 5               | 0 644                | 0 56 | 1 3 | 0 5                 |
| 0 945 | 0 73                | 0 26 | 1881 0  | 1 4 3 1 | 0 4286 | 1 160 | 1 11                | 2 984 9 | 2 2               | 0 898                | 0 80 | 3 1 | 0 2                 |
| 1 957 | 1 72                | 3 36 | 1882 0  | 0 65157 | 1 4913 | 0 402 | 0 34                | 2 33073 | 1 9               | 0 151                | 0 03 | 0 5 | 2 4                 |
| 2 969 | 2 71                | 88   | 1883 0  | 3 43111 | 0 7787 | 1 418 | 1 35                | 1 67716 | 1 6               | 2 956                | 82   | 1 4 | 1 0                 |
| 0 48  | 1                   | 39   | *1884 0 | 2 65946 | 0 661  | 0 659 | 0 58                | 1 02359 | 1 3               | 2 10                 | 2 05 | 2 3 | 3 1                 |
| 2 494 | 20                  | 2 90 | 1885 0  | 2 8878  | 3535   | 0 900 | 0 81                | 1 37002 | 2                 | 2 463                | 2 29 | 0 6 | 2 8                 |
| 0 007 | 3 0                 | 4    | 1886 0  | 1 1618  | 1 416  | 0 141 | 0 04                | 71645   | 1 7               | 1 717                | 1 5  | 1 5 | 1 4                 |
| 1 019 | 0 69                | 1 93 | 1887 0  | 1 34453 | 0 7036 | 1 158 | 1 05                | 0 06 88 | 1 5               | 0 970                | 76   | 2 4 | 0 1                 |
| 2 031 | 1 69                | 1 45 | 1888 0  | 0 57289 | 1 7664 | 0 399 | 28                  | 95935   | 1 2               | 0 224                | 3 54 | 3 2 | 2 2                 |
| 0 545 | 18                  | 1 96 | 1889 0  | 0 801 5 | 0 785  | 640   | 0 51                | 3 30578 | 1 9               | 0 478                | 0 23 | 1 6 | 1 9                 |
| 1 557 | 1 18                | 1 47 | 1890 0  | 0 961   | 1 3412 | 1 656 | 1 52                | 65 21   | 1 6               | 3 28                 | 3 01 | 2 5 | 0 5                 |
| 569   | 17                  | 0 99 | 1891 0  | 80914   | 0 6286 | 897   | 0 75                | 1 99864 | 1 3               | 2 536                | 2 25 | 3 3 | 2 7                 |
| 08    | 3 16                | 50   | 1892 0  | 0375    | 1 6913 | 0 138 | 1 76                | 1 34507 | 1 0               | 1 790                | 1 48 | 7   | 1 3                 |
| 2 094 | 1 66                | 1 0  | 1893 0  | 6586    | 0 2034 | 379   | 0 1                 | 1 69150 | 1 7               | 043                  | 1 72 | 2 6 | 0 9                 |
| 3 1 7 | 2 65                | 0 53 | 1894 0  | 1 49422 | 1 661  | 1 396 | 1 2                 | 1 03793 | 1 4               | 1 297                | 0 95 | 0 0 | 3 1                 |
| 0 618 | 15                  | 0 05 | 1895 0  | 0 72 57 | 0 5535 | 0 637 | 0 45                | 0 38436 | 1 1               | 0 551                | 0 19 | 8   | 1 7                 |
| 1 631 | 1 14                | 3 14 | 1896 0  | 3 50 11 | 1 616  | 1 653 | 1 46                | 3 28083 | 0 9               | 3 355                | 2 97 | 1 7 | 0 4                 |
| 0 144 | 3 14                | 0 07 | 1897 0  | 0 179 9 | 0 1 83 | 0 119 | 1 69                | 0 077 3 | 1 6               | 0 058                | 3 21 | 0 1 | 0                   |
| 1 156 | 63                  | 3 7  | 1898 0  | 95883   | 1 1910 | 1 135 | 92                  | 2 97369 | 1 3               | 863                  | 44   | 0 9 | 2 2                 |
| 2 168 | 1 63                | 2 69 | 1899 0  | 2 18718 | 0 4784 | 0 376 | 0 15                | 3 2012  | 1 0               | 116                  | 1 68 | 1 8 | 0 8                 |
| 3 181 | 6                   | 2 20 | 1900 0  | 1 41554 | 1 5411 | 1 393 | 1 16                | 1 66655 | 0 7               | 1 370                | 0 91 | 7   | 3 0                 |
| 3 500 | 3 50                | 3 58 | Pe rods | 3 55118 | 1 7753 | 1 776 | 1 78                | 3 55003 | 3 5               | 3 551                | 3 55 | 3 5 | 3 6                 |

T a d t h T L g i t l d d t J p t O b i t t i f o l u m m t h p p l m t e d b y t h i t l f T b l XII XXXII



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

| 1                  | 2                      | 3                         | 4                      | 5                      | 6                       | 7                        | 8                       | 9                       | 10                       | 11                       | 12                      | 13                     | 14                     |
|--------------------|------------------------|---------------------------|------------------------|------------------------|-------------------------|--------------------------|-------------------------|-------------------------|--------------------------|--------------------------|-------------------------|------------------------|------------------------|
| Date               | Mean Long.             | A                         | B                      | C                      | D                       | E                        | F                       | G                       | H                        | I                        | J                       | K                      | L                      |
| 1900 <sup>o</sup>  | 98 <sup>o</sup> 24081  | d<br>5 <sup>h</sup> 70977 | d<br>2 <sup>h</sup> 82 | d<br>1 <sup>h</sup> 92 | d<br>2 <sup>h</sup> 596 | d<br>1 <sup>h</sup> 1727 | d<br>1 <sup>h</sup> 739 | d<br>32 <sup>h</sup> 56 | d<br>406 <sup>h</sup> 86 | d<br>139 <sup>h</sup> 57 | d<br>63 <sup>h</sup> 07 | d<br>1 <sup>h</sup> 68 | d<br>1 <sup>h</sup> 78 |
| 1901 <sup>o</sup>  | 20 <sup>o</sup> 02882  | 4 <sup>h</sup> 06156      | 2 <sup>h</sup> 42      | 0 <sup>h</sup> 58      | 1 <sup>h</sup> 654      | 0 <sup>h</sup> 3761      | 0 <sup>h</sup> 961      | 397 <sup>h</sup> 56     | 314 <sup>h</sup> 19      | 22 <sup>h</sup> 27       | 428 <sup>h</sup> 07     | 0 <sup>h</sup> 46      | 2 <sup>h</sup> 93      |
| 1902 <sup>o</sup>  | 301 <sup>o</sup> 81683 | 2 <sup>h</sup> 41335      | 2 <sup>h</sup> 03      | 2 <sup>h</sup> 79      | 0 <sup>h</sup> 713      | 3 <sup>h</sup> 1309      | 0 <sup>h</sup> 182      | 361 <sup>h</sup> 40     | 221 <sup>h</sup> 51      | 387 <sup>h</sup> 27      | 307 <sup>h</sup> 48     | 1 <sup>h</sup> 00      | 0 <sup>h</sup> 59      |
| 1903 <sup>o</sup>  | 223 <sup>o</sup> 60484 | 0 <sup>h</sup> 76514      | 1 <sup>h</sup> 63      | 1 <sup>h</sup> 45      | 3 <sup>h</sup> 324      | 2 <sup>h</sup> 3343      | 2 <sup>h</sup> 955      | 325 <sup>h</sup> 25     | 128 <sup>h</sup> 84      | 269 <sup>h</sup> 97      | 186 <sup>h</sup> 89     | 1 <sup>h</sup> 55      | 1 <sup>h</sup> 74      |
| *1904 <sup>o</sup> | 145 <sup>o</sup> 39285 | 6 <sup>h</sup> 16786      | 1 <sup>h</sup> 23      | 0 <sup>h</sup> 11      | 2 <sup>h</sup> 382      | 1 <sup>h</sup> 5377      | 2 <sup>h</sup> 177      | 289 <sup>h</sup> 09     | 36 <sup>h</sup> 16       | 152 <sup>h</sup> 66      | 66 <sup>h</sup> 30      | 0 <sup>h</sup> 32      | 2 <sup>h</sup> 90      |
| 1905 <sup>o</sup>  | 168 <sup>o</sup> 55562 | 5 <sup>h</sup> 51965      | 1 <sup>h</sup> 84      | 3 <sup>h</sup> 32      | 2 <sup>h</sup> 441      | 1 <sup>h</sup> 7411      | 2 <sup>h</sup> 398      | 253 <sup>h</sup> 93     | 402 <sup>h</sup> 16      | 36 <sup>h</sup> 36       | 432 <sup>h</sup> 30     | 0 <sup>h</sup> 10      | 1 <sup>h</sup> 56      |
| 1906 <sup>o</sup>  | 90 <sup>o</sup> 34363  | 3 <sup>h</sup> 87144      | 1 <sup>h</sup> 44      | 1 <sup>h</sup> 98      | 1 <sup>h</sup> 499      | 0 <sup>h</sup> 9445      | 1 <sup>h</sup> 620      | 217 <sup>h</sup> 78     | 309 <sup>h</sup> 49      | 401 <sup>h</sup> 36      | 311 <sup>h</sup> 71     | 0 <sup>h</sup> 64      | 2 <sup>h</sup> 71      |
| 1907 <sup>o</sup>  | 12 <sup>o</sup> 13164  | 2 <sup>h</sup> 22323      | 1 <sup>h</sup> 04      | 0 <sup>h</sup> 64      | 0 <sup>h</sup> 558      | 0 <sup>h</sup> 1480      | 0 <sup>h</sup> 842      | 181 <sup>h</sup> 62     | 216 <sup>h</sup> 81      | 284 <sup>h</sup> 06      | 191 <sup>h</sup> 12     | 1 <sup>h</sup> 19      | 0 <sup>h</sup> 37      |
| *1908 <sup>o</sup> | 293 <sup>o</sup> 91965 | 0 <sup>h</sup> 57501      | 0 <sup>h</sup> 65      | 2 <sup>h</sup> 85      | 3 <sup>h</sup> 169      | 2 <sup>h</sup> 9028      | 0 <sup>h</sup> 063      | 145 <sup>h</sup> 46     | 124 <sup>h</sup> 14      | 166 <sup>h</sup> 76      | 70 <sup>h</sup> 53      | 1 <sup>h</sup> 73      | 1 <sup>h</sup> 52      |
| 1909 <sup>o</sup>  | 317 <sup>o</sup> 08242 | 6 <sup>h</sup> 97773      | 1 <sup>h</sup> 25      | 2 <sup>h</sup> 51      | 3 <sup>h</sup> 227      | 3 <sup>h</sup> 1062      | 0 <sup>h</sup> 285      | 110 <sup>h</sup> 31     | 32 <sup>h</sup> 46       | 50 <sup>h</sup> 46       | 436 <sup>h</sup> 53     | 1 <sup>h</sup> 51      | 0 <sup>h</sup> 18      |
| 1910 <sup>o</sup>  | 238 <sup>o</sup> 87043 | 5 <sup>h</sup> 32952      | 0 <sup>h</sup> 85      | 1 <sup>h</sup> 17      | 2 <sup>h</sup> 286      | 2 <sup>h</sup> 3096      | 3 <sup>h</sup> 058      | 74 <sup>h</sup> 15      | 397 <sup>h</sup> 46      | 415 <sup>h</sup> 46      | 315 <sup>h</sup> 94     | 0 <sup>h</sup> 29      | 1 <sup>h</sup> 33      |
| 1911 <sup>o</sup>  | 160 <sup>o</sup> 65844 | 3 <sup>h</sup> 68131      | 0 <sup>h</sup> 46      | 3 <sup>h</sup> 38      | 1 <sup>h</sup> 344      | 1 <sup>h</sup> 5130      | 2 <sup>h</sup> 280      | 37 <sup>h</sup> 99      | 304 <sup>h</sup> 79      | 298 <sup>h</sup> 15      | 195 <sup>h</sup> 35     | 0 <sup>h</sup> 83      | 2 <sup>h</sup> 48      |
| *1912 <sup>o</sup> | 82 <sup>o</sup> 44645  | 2 <sup>h</sup> 03310      | 0 <sup>h</sup> 06      | 2 <sup>h</sup> 04      | 0 <sup>h</sup> 403      | 0 <sup>h</sup> 7164      | 1 <sup>h</sup> 501      | 1 <sup>h</sup> 84       | 212 <sup>h</sup> 11      | 180 <sup>h</sup> 85      | 74 <sup>h</sup> 76      | 1 <sup>h</sup> 38      | 0 <sup>h</sup> 14      |
| 1913 <sup>o</sup>  | 105 <sup>o</sup> 60922 | 1 <sup>h</sup> 38489      | 0 <sup>h</sup> 66      | 1 <sup>h</sup> 70      | 0 <sup>h</sup> 461      | 0 <sup>h</sup> 9198      | 1 <sup>h</sup> 723      | 367 <sup>h</sup> 84     | 120 <sup>h</sup> 44      | 64 <sup>h</sup> 55       | 440 <sup>h</sup> 76     | 1 <sup>h</sup> 15      | 2 <sup>h</sup> 29      |
| 1914 <sup>o</sup>  | 27 <sup>o</sup> 39723  | 6 <sup>h</sup> 78760      | 0 <sup>h</sup> 26      | 0 <sup>h</sup> 36      | 3 <sup>h</sup> 072      | 0 <sup>h</sup> 1232      | 0 <sup>h</sup> 944      | 331 <sup>h</sup> 68     | 27 <sup>h</sup> 76       | 429 <sup>h</sup> 55      | 320 <sup>h</sup> 17     | 1 <sup>h</sup> 70      | 3 <sup>h</sup> 45      |
| 1915 <sup>o</sup>  | 309 <sup>o</sup> 18525 | 5 <sup>h</sup> 13939      | 4 <sup>h</sup> 38      | 2 <sup>h</sup> 57      | 2 <sup>h</sup> 131      | 2 <sup>h</sup> 8780      | 0 <sup>h</sup> 166      | 295 <sup>h</sup> 52     | 392 <sup>h</sup> 76      | 312 <sup>h</sup> 25      | 199 <sup>h</sup> 58     | 0 <sup>h</sup> 47      | 1 <sup>h</sup> 11      |
| *1916 <sup>o</sup> | 230 <sup>o</sup> 97326 | 3 <sup>h</sup> 49118      | 3 <sup>h</sup> 98      | 1 <sup>h</sup> 23      | 1 <sup>h</sup> 189      | 2 <sup>h</sup> 0814      | 2 <sup>h</sup> 939      | 259 <sup>h</sup> 37     | 300 <sup>h</sup> 09      | 194 <sup>h</sup> 95      | 78 <sup>h</sup> 99      | 1 <sup>h</sup> 02      | 2 <sup>h</sup> 26      |
| 1917 <sup>o</sup>  | 254 <sup>o</sup> 13603 | 2 <sup>h</sup> 84297      | 0 <sup>h</sup> 07      | 0 <sup>h</sup> 89      | 1 <sup>h</sup> 247      | 2 <sup>h</sup> 2848      | 3 <sup>h</sup> 161      | 224 <sup>h</sup> 21     | 208 <sup>h</sup> 41      | 78 <sup>h</sup> 65       | 444 <sup>h</sup> 99     | 0 <sup>h</sup> 80      | 0 <sup>h</sup> 92      |
| 1918 <sup>o</sup>  | 175 <sup>o</sup> 92404 | 1 <sup>h</sup> 19476      | 4 <sup>h</sup> 19      | 3 <sup>h</sup> 10      | 0 <sup>h</sup> 306      | 1 <sup>h</sup> 4882      | 2 <sup>h</sup> 382      | 188 <sup>h</sup> 05     | 115 <sup>h</sup> 74      | 443 <sup>h</sup> 65      | 324 <sup>h</sup> 40     | 1 <sup>h</sup> 34      | 2 <sup>h</sup> 07      |
| 1919 <sup>o</sup>  | 97 <sup>o</sup> 71205  | 6 <sup>h</sup> 59748      | 3 <sup>h</sup> 79      | 1 <sup>h</sup> 76      | 2 <sup>h</sup> 917      | 0 <sup>h</sup> 6916      | 1 <sup>h</sup> 604      | 151 <sup>h</sup> 90     | 23 <sup>h</sup> 06       | 326 <sup>h</sup> 34      | 203 <sup>h</sup> 81     | 0 <sup>h</sup> 12      | 3 <sup>h</sup> 22      |
| *1920 <sup>o</sup> | 19 <sup>o</sup> 50006  | 4 <sup>h</sup> 94927      | 3 <sup>h</sup> 39      | 0 <sup>h</sup> 42      | 1 <sup>h</sup> 976      | 3 <sup>h</sup> 4465      | 0 <sup>h</sup> 826      | 115 <sup>h</sup> 74     | 388 <sup>h</sup> 06      | 209 <sup>h</sup> 04      | 83 <sup>h</sup> 22      | 0 <sup>h</sup> 66      | 0 <sup>h</sup> 88      |
| 1921 <sup>o</sup>  | 42 <sup>o</sup> 66283  | 4 <sup>h</sup> 30106      | 4 <sup>h</sup> 00      | 0 <sup>h</sup> 07      | 2 <sup>h</sup> 034      | 0 <sup>h</sup> 0985      | 1 <sup>h</sup> 047      | 80 <sup>h</sup> 58      | 296 <sup>h</sup> 39      | 92 <sup>h</sup> 74       | 449 <sup>h</sup> 22     | 0 <sup>h</sup> 44      | 3 <sup>h</sup> 03      |
| 1922 <sup>o</sup>  | 324 <sup>o</sup> 45084 | 2 <sup>h</sup> 65285      | 3 <sup>h</sup> 60      | 2 <sup>h</sup> 29      | 1 <sup>h</sup> 092      | 2 <sup>h</sup> 8533      | 0 <sup>h</sup> 269      | 44 <sup>h</sup> 42      | 203 <sup>h</sup> 71      | 457 <sup>h</sup> 74      | 328 <sup>h</sup> 63     | 0 <sup>h</sup> 98      | 0 <sup>h</sup> 69      |
| 1923 <sup>o</sup>  | 246 <sup>o</sup> 23885 | 1 <sup>h</sup> 00464      | 3 <sup>h</sup> 20      | 0 <sup>h</sup> 95      | 0 <sup>h</sup> 151      | 2 <sup>h</sup> 0567      | 3 <sup>h</sup> 042      | 8 <sup>h</sup> 27       | 111 <sup>h</sup> 04      | 340 <sup>h</sup> 44      | 208 <sup>h</sup> 05     | 1 <sup>h</sup> 53      | 1 <sup>h</sup> 84      |
| *1924 <sup>o</sup> | 168 <sup>o</sup> 02686 | 6 <sup>h</sup> 40735      | 2 <sup>h</sup> 81      | 3 <sup>h</sup> 16      | 2 <sup>h</sup> 762      | 1 <sup>h</sup> 2601      | 2 <sup>h</sup> 263      | 373 <sup>h</sup> 27     | 18 <sup>h</sup> 36       | 223 <sup>h</sup> 14      | 87 <sup>h</sup> 46      | 0 <sup>h</sup> 31      | 3 <sup>h</sup> 00      |
| 1925 <sup>o</sup>  | 191 <sup>o</sup> 18963 | 5 <sup>h</sup> 75914      | 3 <sup>h</sup> 41      | 2 <sup>h</sup> 82      | 2 <sup>h</sup> 820      | 1 <sup>h</sup> 4635      | 2 <sup>h</sup> 485      | 338 <sup>h</sup> 11     | 384 <sup>h</sup> 36      | 106 <sup>h</sup> 83      | 453 <sup>h</sup> 46     | 0 <sup>h</sup> 08      | 1 <sup>h</sup> 66      |
| 1926 <sup>o</sup>  | 112 <sup>o</sup> 97764 | 4 <sup>h</sup> 11093      | 3 <sup>h</sup> 01      | 1 <sup>h</sup> 48      | 1 <sup>h</sup> 879      | 0 <sup>h</sup> 6669      | 1 <sup>h</sup> 707      | 301 <sup>h</sup> 95     | 291 <sup>h</sup> 69      | 471 <sup>h</sup> 83      | 332 <sup>h</sup> 87     | 0 <sup>h</sup> 63      | 2 <sup>h</sup> 81      |
| 1927 <sup>o</sup>  | 34 <sup>o</sup> 76565  | 2 <sup>h</sup> 46272      | 2 <sup>h</sup> 62      | 0 <sup>h</sup> 13      | 0 <sup>h</sup> 937      | 3 <sup>h</sup> 4217      | 0 <sup>h</sup> 928      | 265 <sup>h</sup> 79     | 199 <sup>h</sup> 01      | 354 <sup>h</sup> 53      | 212 <sup>h</sup> 28     | 1 <sup>h</sup> 17      | 0 <sup>h</sup> 47      |
| *1928 <sup>o</sup> | 316 <sup>o</sup> 55365 | 0 <sup>h</sup> 81451      | 2 <sup>h</sup> 22      | 2 <sup>h</sup> 35      | 3 <sup>h</sup> 548      | 2 <sup>h</sup> 6251      | 0 <sup>h</sup> 150      | 229 <sup>h</sup> 64     | 106 <sup>h</sup> 34      | 237 <sup>h</sup> 23      | 91 <sup>h</sup> 69      | 1 <sup>h</sup> 72      | 1 <sup>h</sup> 62      |
| 1929 <sup>o</sup>  | 339 <sup>o</sup> 71644 | 0 <sup>h</sup> 16630      | 2 <sup>h</sup> 82      | 2 <sup>h</sup> 01      | 0 <sup>h</sup> 054      | 2 <sup>h</sup> 8285      | 0 <sup>h</sup> 372      | 194 <sup>h</sup> 48     | 14 <sup>h</sup> 66       | 120 <sup>h</sup> 93      | 457 <sup>h</sup> 69     | 1 <sup>h</sup> 49      | 0 <sup>h</sup> 28      |
| 1930 <sup>o</sup>  | 261 <sup>o</sup> 50445 | 5 <sup>h</sup> 56901      | 2 <sup>h</sup> 43      | 0 <sup>h</sup> 66      | 2 <sup>h</sup> 665      | 2 <sup>h</sup> 0319      | 3 <sup>h</sup> 144      | 158 <sup>h</sup> 32     | 379 <sup>h</sup> 66      | 3 <sup>h</sup> 63        | 337 <sup>h</sup> 10     | 0 <sup>h</sup> 27      | 1 <sup>h</sup> 43      |
| 1931 <sup>o</sup>  | 183 <sup>o</sup> 29246 | 3 <sup>h</sup> 92080      | 2 <sup>h</sup> 03      | 2 <sup>h</sup> 88      | 1 <sup>h</sup> 724      | 1 <sup>h</sup> 2353      | 2 <sup>h</sup> 366      | 122 <sup>h</sup> 17     | 286 <sup>h</sup> 99      | 368 <sup>h</sup> 63      | 216 <sup>h</sup> 51     | 0 <sup>h</sup> 81      | 2 <sup>h</sup> 58      |
| *1932 <sup>o</sup> | 105 <sup>o</sup> 08047 | 2 <sup>h</sup> 27259      | 1 <sup>h</sup> 63      | 1 <sup>h</sup> 54      | 0 <sup>h</sup> 782      | 0 <sup>h</sup> 4387      | 1 <sup>h</sup> 588      | 86 <sup>h</sup> 01      | 194 <sup>h</sup> 32      | 251 <sup>h</sup> 32      | 95 <sup>h</sup> 92      | 1 <sup>h</sup> 36      | 0 <sup>h</sup> 24      |
| 1933 <sup>o</sup>  | 128 <sup>o</sup> 24324 | 1 <sup>h</sup> 62438      | 2 <sup>h</sup> 24      | 1 <sup>h</sup> 19      | 0 <sup>h</sup> 841      | 0 <sup>h</sup> 6421      | 1 <sup>h</sup> 809      | 50 <sup>h</sup> 85      | 102 <sup>h</sup> 64      | 135 <sup>h</sup> 02      | 461 <sup>h</sup> 92     | 1 <sup>h</sup> 14      | 2 <sup>h</sup> 39      |
| 1934 <sup>o</sup>  | 50 <sup>o</sup> 03125  | 7 <sup>h</sup> 02710      | 1 <sup>h</sup> 84      | 3 <sup>h</sup> 41      | 3 <sup>h</sup> 452      | 3 <sup>h</sup> 3970      | 1 <sup>h</sup> 031      | 14 <sup>h</sup> 70      | 9 <sup>h</sup> 97        | 17 <sup>h</sup> 72       | 341 <sup>h</sup> 33     | 1 <sup>h</sup> 68      | 0 <sup>h</sup> 05      |
| 1935 <sup>o</sup>  | 331 <sup>o</sup> 81926 | 5 <sup>h</sup> 37889      | 1 <sup>h</sup> 44      | 2 <sup>h</sup> 07      | 2 <sup>h</sup> 510      | 2 <sup>h</sup> 6004      | 0 <sup>h</sup> 253      | 379 <sup>h</sup> 70     | 374 <sup>h</sup> 97      | 382 <sup>h</sup> 72      | 220 <sup>h</sup> 74     | 0 <sup>h</sup> 47      | 1 <sup>h</sup> 21      |
| *1936 <sup>o</sup> | 253 <sup>o</sup> 60727 | 3 <sup>h</sup> 73068      | 1 <sup>h</sup> 05      | 0 <sup>h</sup> 72      | 1 <sup>h</sup> 569      | 1 <sup>h</sup> 8038      | 3 <sup>h</sup> 026      | 343 <sup>h</sup> 54     | 282 <sup>h</sup> 29      | 265 <sup>h</sup> 42      | 100 <sup>h</sup> 15     | 1 <sup>h</sup> 00      | 2 <sup>h</sup> 36      |
| 1937 <sup>o</sup>  | 276 <sup>o</sup> 77004 | 3 <sup>h</sup> 08247      | 1 <sup>h</sup> 65      | 0 <sup>h</sup> 38      | 1 <sup>h</sup> 627      | 2 <sup>h</sup> 0072      | 3 <sup>h</sup> 247      | 308 <sup>h</sup> 38     | 190 <sup>h</sup> 62      | 149 <sup>h</sup> 12      | 466 <sup>h</sup> 15     | 0 <sup>h</sup> 78      | 1 <sup>h</sup> 02      |
| 1938 <sup>o</sup>  | 198 <sup>o</sup> 55805 | 1 <sup>h</sup> 43426      | 1 <sup>h</sup> 25      | 2 <sup>h</sup> 60      | 0 <sup>h</sup> 685      | 1 <sup>h</sup> 2106      | 2 <sup>h</sup> 469      | 272 <sup>h</sup> 23     | 97 <sup>h</sup> 94       | 31 <sup>h</sup> 81       | 345 <sup>h</sup> 56     | 1 <sup>h</sup> 32      | 2 <sup>h</sup> 17      |
| 1939 <sup>o</sup>  | 120 <sup>o</sup> 34606 | 6 <sup>h</sup> 83697      | 0 <sup>h</sup> 86      | 1 <sup>h</sup> 25      | 3 <sup>h</sup> 297      | 0 <sup>h</sup> 4140      | 1 <sup>h</sup> 690      | 236 <sup>h</sup> 07     | 5 <sup>h</sup> 27        | 396 <sup>h</sup> 81      | 224 <sup>h</sup> 97     | 0 <sup>h</sup> 10      | 3 <sup>h</sup> 32      |
| *1940 <sup>o</sup> | 42 <sup>o</sup> 13407  | 5 <sup>h</sup> 18876      | 0 <sup>h</sup> 46      | 3 <sup>h</sup> 47      | 2 <sup>h</sup> 355      | 3 <sup>h</sup> 1688      | 0 <sup>h</sup> 912      | 199 <sup>h</sup> 91     | 370 <sup>h</sup> 27      | 279 <sup>h</sup> 51      | 104 <sup>h</sup> 38     | 0 <sup>h</sup> 64      | 0 <sup>h</sup> 98      |
| 1941 <sup>o</sup>  | 65 <sup>o</sup> 29684  | 4 <sup>h</sup> 54055      | 1 <sup>h</sup> 06      | 3 <sup>h</sup> 13      | 2 <sup>h</sup> 414      | 3 <sup>h</sup> 3722      | 1 <sup>h</sup> 134      | 164 <sup>h</sup> 75     | 278 <sup>h</sup> 59      | 163 <sup>h</sup> 21      | 470 <sup>h</sup> 38     | 0 <sup>h</sup> 42      | 3 <sup>h</sup> 13      |
| 1942 <sup>o</sup>  | 347 <sup>o</sup> 08486 | 2 <sup>h</sup> 89234      | 0 <sup>h</sup> 67      | 1 <sup>h</sup> 78      | 1 <sup>h</sup> 472      | 2 <sup>h</sup> 5756      | 0 <sup>h</sup> 355      | 128 <sup>h</sup> 60     | 185 <sup>h</sup> 92      | 45 <sup>h</sup> 91       | 349 <sup>h</sup> 79     | 0 <sup>h</sup> 97      | 0 <sup>h</sup> 79      |
| 1943 <sup>o</sup>  | 268 <sup>o</sup> 87287 | 1 <sup>h</sup> 24413      | 0 <sup>h</sup> 27      | 0 <sup>h</sup> 44      | 0 <sup>h</sup> 530      | 1 <sup>h</sup> 7790      | 3 <sup>h</sup> 128      | 94 <sup>h</sup> 44      | 93 <sup>h</sup> 24       | 410 <sup>h</sup> 91      | 229 <sup>h</sup> 20     | 1 <sup>h</sup> 51      | 1 <sup>h</sup> 94      |
| *1944 <sup>o</sup> | 190 <sup>o</sup> 66088 | 6 <sup>h</sup> 64685      | 4 <sup>h</sup> 38      | 2 <sup>h</sup> 66      | 3 <sup>h</sup> 142      | 0 <sup>h</sup> 9824      | 2 <sup>h</sup> 350      | 56 <sup>h</sup> 28      | 0 <sup>h</sup> 57        | 293 <sup>h</sup> 61      | 108 <sup>h</sup> 61     | 0 <sup>h</sup> 29      | 3 <sup>h</sup> 10      |
| 1945 <sup>o</sup>  | 213 <sup>o</sup> 82365 | 5 <sup>h</sup> 99864      | 0 <sup>h</sup> 47      | 2 <sup>h</sup> 31      | 3 <sup>h</sup> 200      | 1 <sup>h</sup> 1858      | 2 <sup>h</sup> 572      | 21 <sup>h</sup> 13      | 366 <sup>h</sup> 57      | 177 <sup>h</sup> 31      | 474 <sup>h</sup> 61     | 0 <sup>h</sup> 06      | 1 <sup>h</sup> 76      |
| 1946 <sup>o</sup>  | 135 <sup>o</sup> 61166 | 4 <sup>h</sup> 35042      | 0 <sup>h</sup> 08      | 0 <sup>h</sup> 97      | 2 <sup>h</sup> 258      | 0 <sup>h</sup> 3892      | 1 <sup>h</sup> 793      | 386 <sup>h</sup> 13     | 273 <sup>h</sup> 89      | 60 <sup>h</sup> 00       | 354 <sup>h</sup> 01     | 0 <sup>h</sup> 61      | 2 <sup>h</sup> 91      |
| 1947 <sup>o</sup>  | 57 <sup>o</sup> 39967  | 2 <sup>h</sup> 70221      | 4 <sup>h</sup> 19      | 3 <sup>h</sup> 19      | 1 <sup>h</sup> 317      | 3 <sup>h</sup> 1441      | 1 <sup>h</sup> 015      | 349 <sup>h</sup> 97     | 181 <sup>h</sup> 22      | 425 <sup>h</sup> 00      | 233 <sup>h</sup> 43     | 1 <sup>h</sup> 15      | 0 <sup>h</sup> 57      |
| *1948 <sup>o</sup> | 339 <sup>o</sup> 18768 | 1 <sup>h</sup> 05400      | 3 <sup>h</sup> 80      | 1 <sup>h</sup> 84      | 0 <sup>h</sup> 375      | 2 <sup>h</sup> 3475      | 0 <sup>h</sup> 236      | 313 <sup>h</sup> 81     | 88 <sup>h</sup> 54       | 307 <sup>h</sup> 70      | 112 <sup>h</sup> 84     | 1 <sup>h</sup> 70      | 1 <sup>h</sup> 72      |
| 1949 <sup>o</sup>  | 2 <sup>o</sup> 35045   | 0 <sup>h</sup> 40579      | 4 <sup>h</sup> 40      | 1 <sup>h</sup> 50      | 0 <sup>h</sup> 434      | 2 <sup>h</sup> 5509      | 0 <sup>h</sup> 458      | 278 <sup>h</sup> 66     | 454 <sup>h</sup> 54      | 191 <sup>h</sup> 40      | 478 <sup>h</sup> 84     | 1 <sup>h</sup> 47      | 0 <sup>h</sup> 38      |
| 1950 <sup>o</sup>  | 284 <sup>o</sup> 13846 | 5 <sup>h</sup> 80851      | 4 <sup>h</sup> 00      | 0 <sup>h</sup> 16      | 3 <sup>h</sup> 045      | 1 <sup>h</sup> 7543      | 3 <sup>h</sup> 231      | 242 <sup>h</sup> 50     | 361 <sup>h</sup> 87      | 74 <sup>h</sup> 10       | 358 <sup>h</sup> 25     | 0 <sup>h</sup> 25      | 1 <sup>h</sup> 53      |
| Periods            | ...                    | 7 <sup>h</sup> 05093      | 4 <sup>h</sup> 51      |                        |                         |                          |                         |                         |                          |                          |                         |                        |                        |

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

| 5     | 6    | 7    | 8       | 9       |         |        |       | 3       | 4       | 5     | 6     | 7    | 8     |
|-------|------|------|---------|---------|---------|--------|-------|---------|---------|-------|-------|------|-------|
| M     | N    | O    | P       | Q       | R       | S      | T     | U       | V       | W     | X     | Y    | Z     |
| 3 181 | 1    | 20   | 1900 0  | d       | 1 41554 | 1 5411 | 1 393 | 1 16    | 1 66655 | 0 7   | 1 370 | 0 91 | 7 3 0 |
| 0 693 | 0 11 | 1 71 | 1901 0  | 0 64390 | 0 8 85  | 0 634  | 0 39  | 1 01 98 | 4       | 0 6 4 | 0 14  | 0 1  | 1 6   |
| 1 706 | 1 11 | 1 3  | 1902 0  | 3 42344 | 0 159   | 1 651  | 1 4   | 3594    | 0 1     | 3 428 | 2 93  | 0 9  | 0 3   |
| 718   | 2 10 | 0 74 | 1903 0  | 65 79   | 1 1786  | 0 89   | 0 63  | 3 5588  | 3 4     | 682   | 17    | 1 8  | 2 4   |
| 0 31  | 3 10 | 26   | 1904 0  | 1 88015 | 4660    | 13     | 1 64  | 2 60 31 | 3 1     | 1 936 | 1 40  | 2 7  | 1 1   |
| 43    | 1 59 | 0 77 | 1905 0  | 2 10851 | 0 7534  | 0 374  | 0 9   | 2 94874 | 0 3     | 189   | 1 63  | 1 1  | 0 7   |
| 3 56  | 2 59 | 9    | 1906 0  | 1 33686 | 0 04 8  | 1 390  | 1 10  | 9517    | 0       | 1 443 | 0 87  | 1 9  | 2 9   |
| 0 768 | 0 08 | 3 38 | 1907 0  | 0 565 2 | 1 1035  | 0 631  | 33    | 1 64161 | 3       | 0 697 | 0 10  | 8    | 1 5   |
| 1 780 | 1 8  | 90   | 1908 0  | 3 34476 | 39 9    | 1 648  | 1 34  | 0 98804 | 2 9     | 3 501 | 89    | 0 2  | 0 1   |
| 0 93  | 3 07 | 3 41 | 1909 0  | 0 0 194 | 0 6783  | 113    | 1 57  | 1 33447 | 0 1     | 0 05  | 3 12  | 2 0  | 3 3   |
| 1 305 | 56   | 93   | 1910 0  | 2 80147 | 1 741   | 1 130  | 0 80  | 0 68090 | 3 4     | 3 009 | 2 36  | 2 9  | 2 0   |
| 3 18  | 1 56 | 44   | 1911 0  | 2 02983 | 1 284   | 0 371  | 0 3   | 0 0 733 | 3 1     | 2 62  | 1 59  | 0 3  | 0 6   |
| 3 33  | 55   | 1 95 | 1912 0  | 1 5819  | 0 3158  | 1 387  | 1 04  | 2 9 380 | 8       | 1 516 | 0 83  | 1 2  | 8     |
| 1 844 | 1 5  | 47   | 1913 0  | 1 48655 | 0 6 33  | 1 628  | 1 7   | 3 270 3 | 3 5     | 1 770 | 1 06  | 3 0  | 2 4   |
| 856   | 1    | 1 98 | 1914 0  | 0 7149  | 1 6660  | 869    | 0 50  | 61666   | 3       | 1 3   | 0 30  | 0 4  | 1 0   |
| 0 368 | 3 04 | 1 50 | 1915 0  | 3 49444 | 0 9534  | 0 110  | 1 51  | 1 96309 | 2 9     | 0 277 | 3 08  | 1 3  | 3 2   |
| 1 381 | 53   | 1 1  | *1916 0 | 7 280   | 0 408   | 1 1 7  | 0 74  | 1 30952 | 6       | 3 081 | 32    | 2 1  | 1 8   |
| 3 393 | 53   | 1 52 | 1917 0  | 95116   | 0 528   | 1 368  | 0 97  | 1 65595 | 3 3     | 3 335 | 2 55  | 0 5  | 1 5   |
| 0 906 | 0 0  | 1 04 | 1918 0  | 17951   | 1 59 9  | 0 609  | 0 1   | 1 00238 | 3 0     | 589   | 1 79  | 1 4  | 0 1   |
| 1 918 | 1 01 | 0 55 | 1919 0  | 1 40787 | 0 8783  | 1 6 5  | 1 21  | 0 34881 | 2 8     | 1 84  | 1 02  | 2 3  | 2 3   |
| 2 930 | 01   | 07   | *1920 0 | 63623   | 0 1657  | 0 866  | 0 44  | 3 4528  | 2 5     | 1 096 | 0 6   | 3 1  | 0 9   |
| 1 443 | 0 50 | 0 58 | 1921 0  | 0 86458 | 0 4531  | 1 107  | 0 68  | 0 04168 | 3 2     | 1 350 | 0 49  | 1 5  | 5     |
| 2 455 | 1 50 | 0 10 | 1922 0  | 0 09 94 | 1 5158  | 0 348  | 1 68  | 93814   | 2 9     | 0 603 | 3 8   | 2 4  | 7     |
| 3 468 | 49   | 3 19 | 1923 0  | 87 48   | 0 8 32  | 1 365  | 0 91  | 2 28457 | 2 6     | 3 408 | 2 51  | 3 2  | 1 3   |
| 98    | 3 49 | 2 71 | 1924 0  | 10084   | 0 0906  | 0 606  | 0 15  | 1 631 0 | 2 3     | 662   | 1 75  | 0 6  | 3 5   |
| 993   | 1 98 | 3 2  | 1925 0  | 3 919   | 0 3780  | 847    | 0 38  | 1 97743 | 3 0     | 2 915 | 1 98  | 2 5  | 3 2   |
| 0 505 | 98   | 2 74 | 1926 0  | 1 55755 | 1 4407  | 0 088  | 1 38  | 1 3 387 | 2 7     | 169   | 1 21  | 3 4  | 1 8   |
| 1 517 | 0 47 | 2 25 | 1927 0  | 0 78591 | 0 7 81  | 1 104  | 0 6   | 0 670 9 | 2 5     | 1 4 3 | 0 45  | 0 7  | 0 4   |
| 2 530 | 1 47 | 1 76 | 1928 0  | 0 014 7 | 0 0155  | 0 345  | 1 62  | 0 01673 | 2 2     | 0 676 | 3 23  | 1 6  | 2 6   |
| 1 042 | 3 45 | 8    | 1929 0  | 0 426   | 0 30 9  | 0 586  | 0 08  | 0 36316 | 9       | 930   | 3 47  | 0 0  | 2 2   |
| 0 55  | 0 95 | 1 79 | 1930 0  | 3 02216 | 1 3656  | 1 603  | 1 09  | 3 25962 | 2 6     | 0 184 | 2 70  | 0 9  | 0 9   |
| 3 067 | 1 95 | 1 31 | 1931 0  | 25052   | 0 6530  | 0 844  | 0 32  | 2 60606 | 2 3     | 2 988 | 1 94  | 1 7  | 3 0   |
| 0 580 | 2 94 | 0 8  | 1932 0  | 1 47888 | 1 7157  | 0 085  | 1 33  | 1 95249 | 0       | 2 242 | 1 17  | 2 6  | 1 7   |
| 2 592 | 1 44 | 1 34 | 1933 0  | 1 707 3 | 0 278   | 3 6    | 1 56  | 2 2989  | 2 7     | 2 496 | 1 41  | 1 0  | 1 3   |
| 0 104 | 43   | 0 85 | 1934 0  | 0 93559 | 1 905   | 1 34   | 0 79  | 1 64535 | 2 4     | 1 749 | 0 64  | 1 8  | 3 5   |
| 1 117 | 3 43 | 0 36 | 1935 0  | 0 16395 | 0 5779  | 583    | 0 0   | 0 99178 | 2 1     | 1 003 | 3 43  | 2 7  | 2 1   |
| 2 129 | 0 9  | 3 46 | *1936 0 | 2 94349 | 1 6406  | 1 6 0  | 1 03  | 0 33821 | 1 9     | 0 57  | 2 66  | 0 1  | 0 7   |
| 0 642 | 2 92 | 0 39 | 1937 0  | 3 17184 | 0 15 7  | 0 065  | 1 26  | 0 68464 | 2 6     | 0 510 | 90    | 2 0  | 0 4   |
| 1 654 | 0 41 | 3 49 | 1938 0  | 40 20   | 1 2154  | 1 08   | 49    | 0 03107 | 2 3     | 3 315 | 2 13  | 8    | 2 5   |
| 667   | 1 4  | 3 0  | 1939 0  | 1 6 856 | 5028    | 0 3 3  | 1 50  | 2 9 754 | 2       | 569   | 1 37  | 0 2  | 1 2   |
| 0 180 | 2 40 | 52   | 1940 0  | 85691   | 1 5656  | 1 340  | 0 73  | 27397   | 1 7     | 1 8   | 0 60  | 1 1  | 3 4   |
| 192   | 89   | 3 03 | 1941 0  | 1 85 7  | 0 0777  | 1 581  | 96    | 6 040   | 4       | 0 76  | 0 84  | 2 9  | 3 0   |
| 3 5   | 1 89 | 55   | 1942 0  | 0 31363 | 1 14 4  | 0 8    | 0 19  | 1 96683 | 2 1     | 1 33  | 0 07  | 0 3  | 1 6   |
| 0 717 | 2 88 | 0 6  | 1943 0  | 3 09317 | 0 4278  | 0 063  | 1 20  | 1 31326 | 1 8     | 0 583 | 86    | 1 2  | 0 2   |
| 1 730 | 38   | 1 57 | 1944 0  | 3 152   | 1 4905  | 1 079  | 0 43  | 0 65969 | 1 5     | 3 388 | 9     | 2 1  | 2 4   |
| 0 4   | 37   | 0 9  | 1945 0  | 2 54988 | 0 00 6  | 1 3 0  | 0 66  | 1 00612 | 2 3     | 0 091 | 2 33  | 0 4  | 2 1   |
| 1 255 | 3 37 | 1 60 | 1946 0  | 1 77824 | 1 0653  | 0 561  | 1 67  | 0 35256 | 2 0     | 2 895 | 1 56  | 1 3  | 0 7   |
| 267   | 0 86 | 1 1  | 1947 0  | 1 00660 | 0 3527  | 1 578  | 0 90  | 3 249 2 | 1 7     | 2 149 | 0 79  | 2 2  | 9     |
| 3 79  | 1 85 | 0 63 | 1948 0  | 0 3495  | 1 4154  | 0 819  | 0 13  | 2 59545 | 1 4     | 1 40  | 0 03  | 3 0  | 1 5   |
| 1 792 | 35   | 1 15 | 1949 0  | 0 46331 | 1 70 8  | 1 060  | 0 36  | 2 94188 | 2 1     | 1 656 | 0 6   | 1 4  | 1 1   |
| 2 804 | 1 34 | 0 66 | 1950 0  | 3 24285 | 0 990   | 301    | 1 37  | 2 28831 | 1 8     | 0 910 | 3 05  | 2 3  | 3 3   |
| 3 500 | 3 50 | 3 58 | Periods | 3 55118 | 1 7753  | 1 776  | 1 78  | 3 55003 | 3 5     | 3 551 | 3 55  | 3 5  | 3 6   |

T f l d th T L g i t l d d to J p t O b i t th t i f C l u m m t b p p l m t d by th q t i f T b l XII XXXII

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

| 1       | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9       | 10     | 11     | 12     | 13   | 14   |
|---------|------------|---------|------|------|-------|--------|-------|---------|--------|--------|--------|------|------|
| Date    | Mean Long. | A       | B    | C    | D     | E      | F     | G       | H      | I      | J      | K    | L    |
|         | °          | d       | d    | d    | d     | d      | d     | d       | d      | d      | d      | d    | d    |
| 1950.0  | 284.13846  | 5.80851 | 4.00 | 0.16 | 3.045 | 1.7543 | 3.231 | 242.50  | 361.87 | 74.10  | 358.25 | 0.25 | 1.53 |
| 1951.0  | 205.92647  | 4.16030 | 3.61 | 2.38 | 2.103 | 0.9577 | 2.453 | 206.34  | 269.19 | 439.10 | 237.66 | 0.80 | 2.68 |
| *1952.0 | 127.71448  | 2.51209 | 3.21 | 1.03 | 1.162 | 0.1611 | 1.674 | 170.19  | 176.52 | 321.80 | 117.07 | 1.34 | 0.34 |
| 1953.0  | 150.87725  | 1.86388 | 3.81 | 0.69 | 1.220 | 0.3645 | 1.896 | 135.03  | 84.84  | 205.49 | 483.07 | 1.12 | 2.49 |
| 1954.0  | 72.66526   | 0.21567 | 3.41 | 2.91 | 0.278 | 3.1193 | 1.118 | 98.87   | 449.84 | 88.19  | 362.48 | 1.66 | 0.15 |
| 1955.0  | 354.45327  | 5.61838 | 3.02 | 1.56 | 2.890 | 2.3227 | 0.339 | 62.72   | 357.17 | 453.19 | 241.89 | 0.44 | 1.31 |
| *1956.0 | 276.24128  | 3.97017 | 2.62 | 0.22 | 1.948 | 1.5261 | 3.112 | 26.56   | 264.49 | 335.89 | 121.30 | 0.98 | 2.46 |
| 1957.0  | 299.40406  | 3.32196 | 3.22 | 3.44 | 2.007 | 1.7295 | 3.334 | 392.56  | 172.82 | 219.59 | 1.71   | 0.76 | 1.12 |
| 1958.0  | 221.19207  | 1.67375 | 2.83 | 2.09 | 1.065 | 0.9329 | 2.555 | 356.40  | 80.14  | 102.29 | 366.71 | 1.30 | 2.27 |
| 1959.0  | 142.98008  | 0.02554 | 2.43 | 0.75 | 0.123 | 0.1363 | 1.777 | 320.24  | 445.14 | 467.29 | 246.12 | 0.08 | 3.42 |
| *1960.0 | 64.76809   | 5.42826 | 2.03 | 2.97 | 2.735 | 2.8912 | 0.999 | 284.09  | 352.47 | 349.98 | 125.53 | 0.63 | 1.08 |
| 1961.0  | 87.93086   | 4.78005 | 2.64 | 2.62 | 2.793 | 3.0946 | 1.220 | 248.93  | 260.79 | 233.68 | 5.94   | 0.40 | 3.23 |
| 1962.0  | 9.71887    | 3.13183 | 2.24 | 1.28 | 1.851 | 2.2980 | 0.442 | 212.77  | 168.12 | 116.38 | 370.94 | 0.95 | 0.89 |
| 1963.0  | 291.50688  | 1.48362 | 1.84 | 3.50 | 0.910 | 1.5014 | 3.215 | 176.62  | 75.45  | 481.38 | 250.35 | 1.49 | 2.04 |
| *1964.0 | 213.29489  | 6.88634 | 1.45 | 2.15 | 3.521 | 0.7048 | 2.436 | 140.46  | 440.45 | 364.08 | 129.76 | 0.27 | 3.20 |
| 1965.0  | 236.45766  | 6.23813 | 2.05 | 1.81 | 0.027 | 0.9082 | 2.658 | 105.30  | 348.77 | 247.78 | 10.17  | 0.04 | 1.86 |
| 1966.0  | 158.24567  | 4.58992 | 1.65 | 0.47 | 2.638 | 0.1116 | 1.880 | 69.15   | 256.10 | 130.48 | 375.17 | 0.59 | 3.01 |
| 1967.0  | 80.03368   | 2.94171 | 1.26 | 2.68 | 1.696 | 2.8664 | 1.101 | 32.99   | 163.42 | 13.17  | 254.59 | 1.13 | 0.67 |
| *1968.0 | 1.82169    | 1.29350 | 0.86 | 1.34 | 0.755 | 2.0698 | 0.323 | 397.99  | 70.75  | 378.17 | 134.00 | 1.68 | 1.82 |
| 1969.0  | 24.98447   | 0.64529 | 1.46 | 1.00 | 0.813 | 2.2732 | 0.545 | 362.83  | 436.75 | 261.87 | 14.41  | 1.46 | 0.48 |
| 1970.0  | 306.77248  | 6.04800 | 1.07 | 3.21 | 3.424 | 1.4766 | 3.318 | 326.68  | 344.07 | 144.57 | 379.41 | 0.23 | 1.63 |
| 1971.0  | 228.56049  | 4.39979 | 0.67 | 1.87 | 2.483 | 0.6800 | 2.539 | 290.52  | 251.40 | 27.27  | 258.82 | 0.78 | 2.78 |
| *1972.0 | 150.34850  | 2.75158 | 0.27 | 0.53 | 1.541 | 3.4349 | 1.761 | 254.36  | 158.72 | 392.27 | 138.23 | 1.32 | 0.44 |
| 1973.0  | 173.51127  | 2.10337 | 0.88 | 0.19 | 1.600 | 0.0868 | 1.982 | 219.20  | 67.05  | 275.97 | 18.64  | 1.10 | 2.59 |
| 1974.0  | 95.29928   | 0.45516 | 0.48 | 2.40 | 0.658 | 2.8417 | 1.204 | 183.05  | 432.05 | 158.66 | 383.64 | 1.64 | 0.25 |
| 1975.0  | 17.08729   | 5.85788 | 0.08 | 1.06 | 3.269 | 2.0451 | 0.426 | 146.89  | 339.37 | 41.36  | 263.05 | 0.42 | 1.41 |
| *1976.0 | 298.87530  | 4.20967 | 4.20 | 3.27 | 2.328 | 1.2485 | 3.199 | 110.73  | 246.70 | 406.36 | 142.46 | 0.97 | 2.56 |
| 1977.0  | 322.03807  | 3.56146 | 0.29 | 2.93 | 2.386 | 1.4519 | 3.420 | 75.58   | 155.02 | 290.06 | 22.87  | 0.74 | 1.22 |
| 1978.0  | 243.82608  | 1.91324 | 4.40 | 1.59 | 1.444 | 0.6553 | 2.642 | 39.42   | 62.35  | 172.76 | 387.87 | 1.29 | 2.37 |
| 1979.0  | 165.61409  | 0.26503 | 4.01 | 0.25 | 0.503 | 3.4101 | 1.864 | 3.26    | 427.35 | 55.46  | 267.28 | 0.06 | 0.02 |
| *1980.0 | 87.40210   | 5.66775 | 3.61 | 2.46 | 3.114 | 2.6135 | 1.085 | 368.26  | 334.67 | 420.46 | 146.69 | 0.61 | 1.18 |
| 1981.0  | 110.56487  | 5.01954 | 4.21 | 2.12 | 3.172 | 2.8169 | 1.307 | 333.11  | 243.00 | 304.15 | 27.10  | 0.38 | 3.33 |
| 1982.0  | 32.35288   | 3.37133 | 3.82 | 0.78 | 2.231 | 2.0203 | 0.528 | 296.95  | 150.32 | 186.85 | 392.10 | 0.93 | 0.99 |
| 1983.0  | 314.14089  | 1.72312 | 3.42 | 2.99 | 1.289 | 1.2237 | 3.301 | 260.79  | 57.65  | 69.55  | 271.51 | 1.47 | 2.14 |
| *1984.0 | 235.92890  | 0.07491 | 3.02 | 1.65 | 0.348 | 0.4271 | 2.523 | 224.64  | 422.65 | 434.55 | 150.92 | 0.25 | 3.30 |
| 1985.0  | 259.09168  | 6.47762 | 3.62 | 1.31 | 0.406 | 0.6305 | 2.745 | 189.48  | 330.97 | 318.25 | 31.33  | 0.03 | 1.96 |
| 1986.0  | 180.87969  | 4.82941 | 3.23 | 3.52 | 3.017 | 3.3854 | 1.966 | 153.32  | 238.30 | 200.95 | 396.33 | 0.57 | 3.11 |
| 1987.0  | 102.66770  | 3.18120 | 2.83 | 2.18 | 2.076 | 2.5888 | 1.188 | 117.16  | 145.62 | 83.64  | 275.74 | 1.12 | 0.77 |
| *1988.0 | 24.45571   | 1.53299 | 2.43 | 0.84 | 1.134 | 1.7922 | 0.410 | 81.01   | 52.95  | 448.64 | 155.15 | 1.66 | 1.92 |
| 1989.0  | 47.61848   | 0.88478 | 3.04 | 0.50 | 1.193 | 1.9956 | 0.631 | 45.85   | 418.95 | 332.34 | 35.56  | 1.44 | 0.58 |
| 1990.0  | 329.40649  | 6.28750 | 2.64 | 2.71 | 0.251 | 1.1990 | 3.404 | 9.69    | 326.27 | 215.04 | 400.56 | 0.21 | 1.73 |
| 1991.0  | 251.19450  | 4.63929 | 2.24 | 1.37 | 2.862 | 0.4024 | 2.626 | 374.69  | 233.60 | 97.74  | 279.97 | 0.76 | 2.88 |
| *1992.0 | 172.98251  | 2.99108 | 1.85 | 0.03 | 1.921 | 3.1572 | 1.847 | 338.54  | 140.92 | 462.74 | 159.38 | 1.30 | 0.54 |
| 1993.0  | 196.14528  | 2.34287 | 2.45 | 3.24 | 1.979 | 3.3606 | 2.069 | 303.38  | 49.25  | 346.44 | 39.79  | 1.08 | 2.69 |
| 1994.0  | 117.93329  | 0.69465 | 2.05 | 1.90 | 1.037 | 2.5640 | 1.291 | 267.22  | 414.25 | 229.14 | 404.79 | 1.63 | 0.35 |
| 1995.0  | 39.72130   | 6.09737 | 1.66 | 0.56 | 0.096 | 1.7674 | 0.512 | 231.07  | 321.58 | 111.83 | 284.20 | 0.40 | 1.51 |
| *1996.0 | 321.50931  | 4.44916 | 1.26 | 2.77 | 2.707 | 0.9708 | 3.285 | 194.91  | 228.90 | 476.83 | 163.61 | 0.95 | 2.66 |
| 1997.0  | 344.67209  | 3.80095 | 1.86 | 2.43 | 2.766 | 1.1742 | 3.507 | 159.75  | 137.23 | 360.53 | 44.02  | 0.72 | 1.32 |
| 1998.0  | 266.46010  | 2.15274 | 1.47 | 1.09 | 1.824 | 0.3776 | 2.728 | 123.60  | 44.55  | 243.23 | 409.02 | 1.27 | 2.47 |
| 1999.0  | 188.24811  | 0.50453 | 1.07 | 3.30 | 0.882 | 3.1325 | 1.950 | 87.44   | 409.55 | 125.93 | 288.43 | 0.04 | 0.13 |
| *2000.0 | 110.03612  | 5.90724 | 0.67 | 1.96 | 3.494 | 2.3359 | 1.172 | 51.28   | 316.88 | 8.63   | 167.84 | 0.59 | 1.28 |
| Periods | ...        | 7.05093 | 4.51 | 4.56 | 3.553 | 3.5514 | 3.551 | 4.01.16 | 457.67 | 482.30 | 485.59 | 1.77 | 3.50 |

Constant applied to each entry in Column 2:  $-r^2/3000$ .

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values at Epoch of Mean Longitude and the Arguments

| 5     | 6    | 7    | 8       | 9       |        |       |      | 3       | 4   | 5     | 6      | 7     | 8     |
|-------|------|------|---------|---------|--------|-------|------|---------|-----|-------|--------|-------|-------|
| M     | N    | O    | P       | Q       | R      | S     | T    | U       | V   | W     | X      | Y     | Z     |
| 8 4   | 1 34 | 0 66 | 1950 0  | 3 24 85 | 99     | 0 301 | 1 37 | 28831   | 1 8 | 0 910 | d 3 05 | d 2 3 | d 3 3 |
| 0 317 | 2 34 | 17   | 1951 0  | 471 1   | 0 2776 | 1 317 | 0 60 | 1 63475 | 1 5 | 0 164 | 8      | 3     | 1 9   |
| 1 3 9 | 3 33 | 3 7  | *1952 0 | 1 69956 | 1 34 3 | 558   | 1 61 | 98118   | 1   | 968   | 1 5    | 0 5   | 6     |
| 3 341 | 1 83 | 0    | 1953 0  | 1 9 79  | 1 6 77 | 0 799 | 0 07 | 1 3 761 | 1 9 | 3     | 1 75   | 4     | 0     |
| 0 854 | 8    | 3 30 | 1954 0  | 1 156 8 | 9151   | 0 40  | 1 07 | 67404   | 1 7 | 2 475 | 0 99   | 3 3   | 4     |
| 1 866 | 0 32 | 2 81 | 1955 0  | 0 38463 | 0 2 5  | 1 57  | 30   | 0 0 047 | 1 4 | 1 729 | 0 2    | 0 6   | 1 0   |
| 879   | 1 31 | 2 33 | 1956 0  | 3 16417 | 1 65   | 0 98  | 1 31 | 2 91694 | 1 1 | 0 983 | 3 01   | 1 5   | 3     |
| 1 391 | 3 3  | 84   | 1957 0  | 3 39 53 | 1 55 6 | 539   | 1 54 | 3 6337  | 1 8 | 1 36  | 3 24   | 3 4   | 8     |
| 404   | 8    | 36   | 1958 0  | 6 089   | 0 8400 | 1 555 | 0 77 | 2 6 980 | 1 5 | 0 490 | 48     | 0 8   | 1 5   |
| 3 416 | 1 79 | 1 87 | 1959 0  | 1 849 4 | 1274   | 0 796 | 0 01 | 1 956 3 | 1 2 | 3 95  | 1 71   | 1 6   | 0 1   |
| 929   | 79   | 1 38 | 1960 0  | 1 7760  | 1 1901 | 0 037 | 1 01 | 1 30 66 | 0 9 | 548   | 95     | 2 5   | 2 3   |
| 941   | 8    | 1 9  | 1961 0  | 1 30596 | 1 4775 | 0 78  | 1 4  | 1 64909 | 1 6 | 802   | 1 18   | 0 9   | 1 9   |
| 0 454 | 8    | 1 41 | 1962 0  | 5343    | 0 7649 | 1 95  | 48   | 0 9955  | 1 3 | 2 056 | 4      | 1 7   | 5     |
| 1 466 | 3 7  | 0 93 | 1963 0  | 3 31385 | 0 5 3  | 0 536 | 1 48 | 0 34195 | 1 1 | 1 309 | 3 0    | 2 6   | 2 7   |
| 478   | 77   | 0 44 | 1964 0  | 54 1    | 1 1150 | 1 55  | 0 7  | 3 3842  | 0 8 | 0 563 | 2 44   | 3 5   | 1 3   |
| 0 99  | 76   | 0 96 | 1965 0  | 2 77057 | 1 40 4 | 0 018 | 0 95 | 0 03481 | 1 5 | 0 817 | 67     | 1 9   | 1 0   |
| 003   | 0 25 | 0 47 | 1966 0  | 1 99893 | 0 6898 | 1 034 | 18   | 93128   | 1   | 0 070 | 1 91   | 2 7   | 3 1   |
| 3 016 | 1 25 | 3 57 | 1967 0  | 1 27 8  | 1 75 6 | 0 275 | 1 19 | 2 7771  | 0 9 | 875   | 1 14   | 0 1   | 1 8   |
| 0 5 8 | 4    | 3 08 | *1968 0 | 45564   | 1 0400 | 1 92  | 0 4  | 1 62414 | 0 6 | 129   | 0 37   | 1 0   | 0 4   |
| 2 541 | 0 74 | 0 1  | 1969 0  | 0 684   | 1 3 74 | 1 533 | 0 65 | 1 97057 | 1 3 | 2 38  | 0 61   | 8     | 0 0   |
| 0 053 | 1 73 | 3 11 | 1970 0  | 3 46354 | 0 6148 | 0 774 | 1 66 | 1 3170  | 1 0 | 1 636 | 3 40   | 0 2   | 2 2   |
| 1 066 | 73   | 6    | 1971 0  | 69189   | 1 6775 | 0 15  | 0 89 | 0 66344 | 0 7 | 0 890 | 2 63   | 1 1   | 0 8   |
| 0 78  | 2    | 2 14 | *1972 0 | 1 9 0 5 | 0 9649 | 1 32  | 0 1  | 0 0 987 | 0 5 | 0 143 | 1 86   | 2 0   | 3 0   |
| 0 591 | 22   | 65   | 1973 0  | 2 14861 | 1 5 3  | 1 73  | 0 35 | 0 35630 | 1 2 | 0 397 | 10     | 0 3   | 2 7   |
| 1 603 | 3 1  | 17   | 1974 0  | 1 37696 | 0 5397 | 0 514 | 1 36 | 3 5 76  | 9   | 3 02  | 1 33   | 1     | 1 3   |
| 2 616 | 0 7  | 1 68 | 1975 0  | 6053    | 1 6024 | 1 530 | 59   | 59919   | 0 6 | 2 455 | 0 57   | 2 1   | 3 5   |
| 0 128 | 1 70 | 1 0  | *1976 0 | 3 38486 | 0 8898 | 0 771 | 1 60 | 1 94563 | 0 3 | 1 709 | 3 35   | 9     | 2 1   |
| 141   | 0 19 | 1 71 | 1977 0  | 0 06 04 | 1 1772 | 1 01  | 0 05 | 29 06   | 1 0 | 1 963 | 0 04   | 1 3   | 1 7   |
| 3 153 | 1 19 | 1 22 | 1978 0  | 2 84157 | 0 4646 | 0 53  | 1 06 | 1 63849 | 0 7 | 1 216 | 2 82   | 2 2   | 0 4   |
| 0 665 | 2 18 | 0 73 | 1979 0  | 6993    | 1 5273 | 1 70  | 0 29 | 0 9849  | 0 4 | 0 470 | 0 6    | 3 1   | 2 5   |
| 1 678 | 3 18 | 0 5  | *1980 0 | 1 98 9  | 0 8147 | 0 511 | 1 30 | 0 33135 | 0 1 | 3 274 | 1 29   | 0 4   | 1     |
| 0 19  | 1 67 | 77   | 1981 0  | 1 5 665 | 1 10 1 | 0 75  | 1 53 | 0 67778 | 0 9 | 3 5 8 | 1 53   | 2 3   | 0 8   |
| 1 03  | 67   | 0 8  | 1982 0  | 0 755 0 | 3895   | 1 769 | 0 76 | 0 02421 | 0 6 | 2 782 | 0 76   | 3 2   | 3 0   |
| 15    | 16   | 3 38 | 1983 0  | 3 53454 | 1 45   | 1 009 | 1 77 | 2 9 068 | 0 3 | 2 035 | 0 0    | 0 5   | 1 6   |
| 3 28  | 1 16 | 89   | 1984 0  | 76 90   | 0 7396 | 0 50  | 1 0  | 2 26711 | 0 0 | 1 89  | 2 78   | 1 4   | 0 2   |
| 1 740 | 3 15 | 3 41 | 1985 0  | 991 6   | 1 0 70 | 0 491 | 1 23 | 61354   | 7   | 1 543 | 3 0    | 3 3   | 3 4   |
| 2 753 | 0 64 | 2 9  | 1986 0  | 2 1961  | 0 3144 | 1 508 | 0 46 | 1 95997 | 0 4 | 0 796 | 2 25   | 0 7   | 2 0   |
| 0 65  | 1 64 | 43   | 1987 0  | 1 44797 | 1 3771 | 0 749 | 1 47 | 1 3 640 | 1   | 0 050 | 1 49   | 1 5   | 0 7   |
| 1 278 | 2 63 | 1 95 | 1988 0  | 0 67633 | 0 6645 | 1 766 | 0 70 | 65 83   | 3 4 | 855   | 0 7    | 4     | 9     |
| 3 290 | 1 13 | 2 46 | 1989 0  | 90468   | 9519   | 0 31  | 0 93 | 0 999 6 | 0 5 | 3 108 | 0 96   | 0 8   | 5     |
| 0 803 | 1    | 1 98 | 1990 0  | 0 13304 | 0 2393 | 1 47  | 0 16 | 0 34570 | 0 3 | 362   | 0 19   | 1 7   | 1 1   |
| 1 815 | 3 12 | 1 49 | 1991 0  | 2 91258 | 1 3020 | 0 488 | 1 17 | 3 24216 | 0 0 | 1 616 | 2 98   | 5     | 3 3   |
| 2 8 7 | 61   | 1 1  | 1992 0  | 2 14094 | 5894   | 1 505 | 0 40 | 2 58859 | 3 2 | 0 869 | 1      | 3 4   | 1 9   |
| 1 340 | 2 61 | 1 52 | 1993 0  | 2 36929 | 0 8769 | 1 746 | 0 63 | 2 9350  | 0 4 | 1 123 | 44     | 1 8   | 1 6   |
| 352   | 0 10 | 1 03 | 1994 0  | 1 59765 | 0 1643 | 0 987 | 1 64 | 2 28145 | 0 1 | 0 377 | 1 68   | 2 6   | 0     |
| 3 365 | 1 09 | 0 55 | 1995 0  | 0 82601 | 1 227  | 0 28  | 0 87 | 1 62789 | 3 4 | 3 181 | 0 91   | 0 0   | 4     |
| 0 877 | 0 9  | 0 06 | *1996 0 | 5437    | 0 5144 | 1 44  | 0 10 | 0 9743  | 3 1 | 2 435 | 0 15   | 0 9   | 1 0   |
| 2 890 | 0 58 | 0 58 | 1997 0  | 0 8 72  | 0 8 18 | 1 484 | 0 34 | 1 3 075 | 0   | 2 689 | 38     | 8     | 6     |
| 0 40  | 1 58 | 0 09 | 1998 0  | 3 06 6  | 0 089  | 0 7 6 | 1 34 | 0 66718 | 3 5 | 1 942 | 3 17   | 0 1   | 8     |
| 1 415 | 2 57 | 3 19 | 1999 0  | 9062    | 1 1519 | 1 743 | 0 57 | 0 01361 | 3 2 | 1 196 | 40     | 1 0   | 1 4   |
| 4 7   | 0 07 | 7    | 2000 0  | 1 51898 | 0 4393 | 0 984 | 1 58 | 91007   | 2 9 | 0 450 | 1 64   | 1 9   | 0 1   |
| 3 50  | 3 50 | 3 58 | Periods | 3 55118 | 1 7753 | 1 776 | 1 78 | 3 55003 | 3 5 | 3 551 | 3 55   | 3 5   | 3 6   |

T a d t l T L g i t d d d t J p t O b i t t h t l f C I m m t b p p l m t d b y t h q i f T b l XII XXXII

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

**X**      **Motions of Mean Longitude and the Arguments for Days**

| 1           | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9     | 10   | 11   | 12    | 13   | 14   |
|-------------|------------|---------|------|------|-------|--------|-------|-------|------|------|-------|------|------|
| Day         | Mean Long. | A       | B    | C    | D     | E      | F     | G-J   | K    | L    | M     | N    | O    |
|             | °          | d       | d    | d    | d     | d      | d     | d     | d    | d    | d     | d    | d    |
| <b>Jan.</b> |            |         |      |      |       |        |       |       |      |      |       |      |      |
| 1           | 101°37476  | 1°00000 | 1°00 | 1°00 | 1°000 | 1°0000 | 1°000 | 1°00  | 1°00 | 1°00 | 1°000 | 1°00 | 1°00 |
| 2           | 202°74952  | 2°00000 | 2°00 | 2°00 | 2°000 | 2°0000 | 2°000 | 2°00  | 0°23 | 2°00 | 2°000 | 2°00 | 2°00 |
| 3           | 304°12429  | 3°00000 | 3°00 | 3°00 | 3°000 | 3°0000 | 3°000 | 3°00  | 1°23 | 3°00 | 3°000 | 3°00 | 3°00 |
| 4           | 45°49905   | 4°00000 | 4°00 | 0°44 | 0°447 | 0°4486 | 0°449 | 4°00  | 0°46 | 0°50 | 0°500 | 0°50 | 0°42 |
| 5           | 146°87381  | 5°00000 | 0°49 | 1°44 | 1°447 | 1°4486 | 1°449 | 5°00  | 1°46 | 1°50 | 1°500 | 1°50 | 1°42 |
| 6           | 248°24857  | 6°00000 | 1°49 | 2°44 | 2°447 | 2°4486 | 2°449 | 6°00  | 0°69 | 2°50 | 2°500 | 2°50 | 2°42 |
| 7           | 349°62333  | 7°00000 | 2°49 | 3°44 | 3°447 | 3°4486 | 3°449 | 7°00  | 1°69 | 0°00 | 0°000 | 0°00 | 3°42 |
| 8           | 90°99809   | 0°94907 | 3°49 | 0°89 | 0°894 | 0°8972 | 0°898 | 8°00  | 0°92 | 1°00 | 1°000 | 1°00 | 0°83 |
| 9           | 192°37286  | 1°94907 | 4°49 | 1°89 | 1°894 | 1°8972 | 1°898 | 9°00  | 0°15 | 2°00 | 2°000 | 2°00 | 1°83 |
| 10          | 293°74762  | 2°94907 | 0°98 | 2°89 | 2°894 | 2°8972 | 2°898 | 10°00 | 1°15 | 3°00 | 3°000 | 3°00 | 2°83 |
| 11          | 35°12238   | 3°94907 | 1°98 | 0°33 | 0°342 | 0°3457 | 0°346 | 11°00 | 0°39 | 0°50 | 0°500 | 0°50 | 0°25 |
| 12          | 136°49714  | 4°94907 | 2°98 | 1°33 | 1°342 | 1°3457 | 1°346 | 12°00 | 1°39 | 1°50 | 1°500 | 1°50 | 1°25 |
| 13          | 237°87190  | 5°94907 | 3°98 | 2°33 | 2°342 | 2°3457 | 2°346 | 13°00 | 0°62 | 2°50 | 2°500 | 2°50 | 2°25 |
| 14          | 339°24666  | 6°94907 | 0°47 | 3°33 | 3°342 | 3°3457 | 3°346 | 14°00 | 1°62 | 0°01 | 0°000 | 0°00 | 3°25 |
| 15          | 80°62143   | 0°89815 | 1°47 | 0°77 | 0°789 | 0°7943 | 0°795 | 15°00 | 0°85 | 1°01 | 1°000 | 1°00 | 0°67 |
| 16          | 181°99619  | 1°89815 | 2°47 | 1°77 | 1°789 | 1°7943 | 1°795 | 16°00 | 0°08 | 2°01 | 2°000 | 2°00 | 1°67 |
| 17          | 283°37095  | 2°89815 | 3°47 | 2°77 | 2°789 | 2°7943 | 2°795 | 17°00 | 1°08 | 3°01 | 3°000 | 3°00 | 2°67 |
| 18          | 24°74571   | 3°89815 | 4°47 | 0°22 | 0°236 | 0°2429 | 0°244 | 18°00 | 0°31 | 0°51 | 0°501 | 0°50 | 0°08 |
| 19          | 126°12047  | 4°89815 | 0°96 | 1°22 | 1°236 | 1°2429 | 1°244 | 19°00 | 1°31 | 1°51 | 1°501 | 1°50 | 1°08 |
| 20          | 227°49523  | 5°89815 | 1°96 | 2°22 | 2°236 | 2°2429 | 2°244 | 20°00 | 0°54 | 2°51 | 2°501 | 2°50 | 2°08 |
| 21          | 328°87000  | 6°89815 | 2°96 | 3°22 | 3°236 | 3°2429 | 3°244 | 21°00 | 1°54 | 0°01 | 0°001 | 0°00 | 3°08 |
| 22          | 70°24476   | 0°84722 | 3°96 | 0°66 | 0°683 | 0°6915 | 0°693 | 22°00 | 0°77 | 1°01 | 1°001 | 1°00 | 0°50 |
| 23          | 171°61952  | 1°84722 | 0°44 | 1°66 | 1°683 | 1°6915 | 1°693 | 23°00 | 0°00 | 2°01 | 2°001 | 2°00 | 1°50 |
| 24          | 272°99428  | 2°84722 | 1°44 | 2°66 | 2°683 | 2°6915 | 2°693 | 24°00 | 1°00 | 3°01 | 3°001 | 3°00 | 2°50 |
| 25          | 14°36904   | 3°84722 | 2°44 | 0°10 | 0°130 | 0°1400 | 0°141 | 25°00 | 0°23 | 0°51 | 0°501 | 0°50 | 3°50 |
| 26          | 115°74380  | 4°84722 | 3°44 | 1°10 | 1°130 | 1°1400 | 1°141 | 26°00 | 1°23 | 1°51 | 1°501 | 1°50 | 0°92 |
| 27          | 217°11857  | 5°84722 | 4°44 | 2°10 | 2°130 | 2°1400 | 2°141 | 27°00 | 0°46 | 2°51 | 2°501 | 2°50 | 1°92 |
| 28          | 318°49333  | 6°84722 | 0°93 | 3°10 | 3°130 | 3°1400 | 3°141 | 28°00 | 1°46 | 0°01 | 0°001 | 0°00 | 2°92 |
| 29          | 59°86809   | 0°79629 | 1°93 | 0°55 | 0°577 | 0°5886 | 0°590 | 29°00 | 0°69 | 1°01 | 1°001 | 1°00 | 0°33 |
| 30          | 161°24285  | 1°79629 | 2°93 | 1°55 | 1°577 | 1°5886 | 1°590 | 30°00 | 1°69 | 2°01 | 2°001 | 2°00 | 1°33 |
| <b>Feb.</b> |            |         |      |      |       |        |       |       |      |      |       |      |      |
| 31          | 262°61761  | 2°79629 | 3°93 | 2°55 | 2°577 | 2°5886 | 2°590 | 31°00 | 0°92 | 3°01 | 3°001 | 3°00 | 2°33 |
| 1           | 3°99237    | 3°79629 | 0°42 | 3°55 | 0°025 | 0°0372 | 0°039 | 32°00 | 0°15 | 0°51 | 0°501 | 0°50 | 3°33 |
| 2           | 105°36714  | 4°79629 | 1°42 | 0°99 | 1°025 | 1°0372 | 1°039 | 33°00 | 1°15 | 1°51 | 1°501 | 1°50 | 0°75 |
| 3           | 206°74190  | 5°79629 | 2°42 | 1°99 | 2°025 | 2°0372 | 2°039 | 34°00 | 0°39 | 2°51 | 2°501 | 2°50 | 1°75 |
| 4           | 308°11666  | 6°79629 | 3°42 | 2°99 | 3°025 | 3°0372 | 3°039 | 35°00 | 1°39 | 0°01 | 0°001 | 0°00 | 2°75 |
| 5           | 49°49142   | 0°74536 | 4°42 | 0°43 | 0°472 | 0°4858 | 0°488 | 36°00 | 0°62 | 1°01 | 1°001 | 1°00 | 0°17 |
| 6           | 150°86618  | 1°74536 | 0°91 | 1°43 | 1°472 | 1°4858 | 1°488 | 37°00 | 1°62 | 2°01 | 2°001 | 2°00 | 1°17 |
| 7           | 252°24094  | 2°74536 | 1°91 | 2°43 | 2°472 | 2°4858 | 2°488 | 38°00 | 0°85 | 3°01 | 3°001 | 3°00 | 2°17 |
| 8           | 353°61571  | 3°74536 | 2°91 | 3°43 | 3°472 | 3°4858 | 3°488 | 39°00 | 0°08 | 0°52 | 0°501 | 0°50 | 3°17 |
| 9           | 94°99047   | 4°74536 | 3°91 | 0°88 | 0°919 | 0°9343 | 0°936 | 40°00 | 1°08 | 1°52 | 1°501 | 1°50 | 0°58 |
| 10          | 196°36523  | 5°74536 | 0°40 | 1°88 | 1°919 | 1°9343 | 1°936 | 41°00 | 0°31 | 2°52 | 2°501 | 2°50 | 1°58 |
| 11          | 297°73999  | 6°74536 | 1°40 | 2°88 | 2°919 | 2°9343 | 2°936 | 42°00 | 1°31 | 0°02 | 0°001 | 0°00 | 2°58 |
| 12          | 39°11475   | 0°69444 | 2°40 | 0°32 | 0°366 | 0°3829 | 0°385 | 43°00 | 0°54 | 1°02 | 1°001 | 1°00 | 0°00 |
| 13          | 140°48951  | 1°69444 | 3°40 | 1°32 | 1°366 | 1°3829 | 1°385 | 44°00 | 1°54 | 2°02 | 2°001 | 2°00 | 1°00 |
| 14          | 241°86428  | 2°69444 | 4°40 | 2°32 | 2°366 | 2°3829 | 2°385 | 45°00 | 0°77 | 3°02 | 3°001 | 3°00 | 2°00 |
| 15          | 343°23904  | 3°69444 | 0°89 | 3°32 | 3°366 | 3°3829 | 3°385 | 46°00 | 0°00 | 0°52 | 0°501 | 0°50 | 3°00 |
| 16          | 84°61380   | 4°69444 | 1°89 | 0°76 | 0°813 | 0°8315 | 0°834 | 47°00 | 1°00 | 1°52 | 1°501 | 1°50 | 0°42 |
| 17          | 185°98856  | 5°69444 | 2°89 | 1°76 | 1°813 | 1°8315 | 1°834 | 48°00 | 0°23 | 2°52 | 2°501 | 2°50 | 1°42 |
| 18          | 287°36332  | 6°69444 | 3°89 | 2°76 | 2°813 | 2°8315 | 2°834 | 49°00 | 1°23 | 0°02 | 0°002 | 0°00 | 2°42 |
| 19          | 28°73808   | 0°64351 | 0°38 | 0°21 | 0°260 | 0°2801 | 0°283 | 50°00 | 0°46 | 1°02 | 1°002 | 1°00 | 3°42 |
| 20          | 130°11285  | 1°64351 | 1°38 | 1°21 | 1°260 | 1°2801 | 1°283 | 51°00 | 1°46 | 2°02 | 2°002 | 2°00 | 0°84 |
| 21          | 231°48761  | 2°64351 | 2°38 | 2°21 | 2°260 | 2°2801 | 2°283 | 52°00 | 0°70 | 3°02 | 3°002 | 3°00 | 1°84 |
| 22          | 332°86237  | 3°64351 | 3°38 | 3°21 | 3°260 | 3°2801 | 3°283 | 53°00 | 1°70 | 0°52 | 0°502 | 0°50 | 2°84 |

In Leap Year diminish the date in Columns 1, 25, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

### X Motions of Mean Longitude and the Arguments for Days

| 5          | 6     | 7       | 8      | 9      |      |         |     | 3     | 4    | 5   | 6   |
|------------|-------|---------|--------|--------|------|---------|-----|-------|------|-----|-----|
| Day        | P     | Q       | R      | S      | T    | U       | V   | W     | X    | Y   | Z   |
| <b>Jan</b> |       |         |        | d      |      |         |     | d     | d    |     | d   |
| 1          | 0 03  | 1 000   | 1 0000 | 1 000  | 1 00 | 1 0000  | 1 0 | 1 00  | 1 00 | 1 0 | 1 0 |
| 2          | 0 5   | 2 00    | 0 47   | 2 4    | 0 2  | 000     | 0   | 0     | 00   | 2 0 | 2 0 |
| 3          | 0 008 | 3 0000  | 1 2 47 | 1 4    | 1    | 3 00 0  | 3 0 | 3 00  | 3 00 | 3 0 | 3 0 |
| 4          | 0 011 | 0 4488  | 4494   | 0 449  | 0 45 | 0 44997 | 0 5 | 0 449 | 45   | 0 5 | 0 4 |
| 5          | 0 014 | 1 4488  | 1 4494 | 1 449  | 1 45 | 1 44997 | 1 5 | 1 449 | 1 45 | 1 5 | 1 4 |
| 6          | 0 016 | 4488    | 0 6741 | 0 673  | 0 67 | 44997   | 2 5 | 2 449 | 45   | 2 5 | 2 4 |
| 7          | 19    | 3 4488  | 1 6741 | 1 673  | 1 67 | 3 44997 | 3 5 | 3 449 | 3 45 | 0 0 | 3 4 |
| 8          | 0 0   | 89764   | 0 8988 | 0 898  | 0 90 | 0 89993 | 0 9 | 0 898 | 0 9  | 1 0 | 0 9 |
| 9          | 0 5   | 1 89764 | 0 1 35 | 1 2    | 0 1  | 1 89993 | 1 9 | 1 898 | 1 90 | 2 0 | 1 9 |
| 10         | 0 027 | 2 89764 | 1 1 35 | 1 12   | 1 1  | 2 89993 | 2 9 | 2 898 | 90   | 3 0 | 9   |
| 11         | 0 30  | 3 4646  | 0 348  | 0 347  | 0 35 | 0 34990 | 0 4 | 3 47  | 0 35 | 5   | 0 3 |
| 12         | 0 033 | 1 34646 | 1 3482 | 1 347  | 1 35 | 1 34990 | 1 4 | 1 347 | 1 35 | 1 5 | 1 3 |
| 13         | 36    | 2 34646 | 57 9   | 57 1   | 57   | 2 3499  | 4   | 2 347 | 35   | 5   | 2 3 |
| 14         | 0 038 | 3 34646 | 1 57 9 | 1 57 1 | 1 57 | 3 34990 | 3 4 | 3 347 | 3 35 | 0 0 | 3 3 |
| 15         | 0 041 | 795 8   | 0 7976 | 0 796  | 0 8  | 0 79980 | 0 8 | 0 796 | 0 80 | 1 0 | 0 8 |
| 16         | 0 044 | 1 79528 | 0 02 3 | 0 0 0  | 0 02 | 1 79986 | 1 8 | 1 796 | 1 80 | 0   | 1 8 |
| 17         | 47    | 79528   | 1 02 3 | 1 020  | 1 0  | 79986   | 8   | 2 796 | 2 80 | 3 0 | 2 8 |
| 18         | 0 049 | 0 24409 | 0 47   | 0 45   | 0 4  | 0 24983 | 0 3 | 0 245 | 0 24 | 0 5 | 0 2 |
| 19         | 0 052 | 1 4409  | 1 470  | 1 245  | 1 24 | 1 4983  | 1 3 | 1 245 | 1 24 | 1 5 | 1 2 |
| 20         | 0 055 | 2 4409  | 0 4717 | 0 469  | 0 47 | 4983    | 2 3 | 2 245 | 2 24 | 2 5 | 2 2 |
| 21         | 0 058 | 3 4409  | 1 4717 | 1 469  | 1 47 | 3 24983 | 3 3 | 3 45  | 3 24 | 0   | 3 2 |
| 22         | 0 060 | 0 69 91 | 0 6964 | 0 694  | 69   | 0 69979 | 0 7 | 0 694 | 0 69 | 1 0 | 0 7 |
| 23         | 0 063 | 1 69291 | 1 6964 | 1 694  | 1 69 | 1 69979 | 1 7 | 1 694 | 1 69 | 0   | 1 7 |
| 24         | 0 066 | 2 69291 | 0 9210 | 0 918  | 0 9  | 2 69979 | 7   | 2 694 | 2 69 | 3 0 | 2 7 |
| 25         | 0 068 | 0 14173 | 0 1457 | 0 143  | 0 14 | 0 14976 | 0 2 | 0 143 | 0 14 | 0 5 | 0 1 |
| 26         | 0 071 | 1 14173 | 1 1457 | 1 143  | 1 14 | 1 14976 | 1 2 | 1 143 | 1 14 | 1 5 | 1 1 |
| 27         | 0 074 | 2 14173 | 0 37 4 | 0 367  | 0 37 | 14976   | 2   | 2 143 | 2 14 | 2 5 | 2 1 |
| 28         | 0 077 | 3 14173 | 1 3704 | 1 367  | 1 37 | 3 14976 | 3   | 3 143 | 3 14 | 0 0 | 3 1 |
| 29         | 0 079 | 0 59055 | 0 5951 | 59     | 0 59 | 0 59972 | 0 6 | 0 593 | 0 59 | 1 0 | 0 5 |
| 30         | 0 082 | 1 59055 | 1 5951 | 1 59   | 1 59 | 1 5997  | 1 6 | 1 593 | 1 59 | 0   | 1 5 |
| <b>Feb</b> |       |         |        |        |      |         |     |       |      |     |     |
| 31         | 0 085 | 2 59055 | 0 8198 | 0 816  | 0 8  | 2 59972 | 2 6 | 2 593 | 2 59 | 3 0 | 5   |
| 1          | 0 88  | 0 03937 | 0 0445 | 0 040  | 0 04 | 0 04969 | 0 1 | 0 042 | 0 04 | 0 5 | 0 0 |
| 2          | 0 090 | 1 3937  | 1 445  | 1 40   | 1 04 | 1 04969 | 1 1 | 1 042 | 1 04 | 1 5 | 1 0 |
| 3          | 0 093 | 2 03937 | 0 2692 | 0 65   | 0 26 | 04969   | 1   | 042   | 2 04 | 5   | 0   |
| 4          | 0 096 | 3 3937  | 1 692  | 1 265  | 1 26 | 3 04969 | 3 1 | 3 04  | 3 04 | 0 0 | 3 0 |
| 5          | 0 099 | 0 48819 | 4939   | 0 489  | 0 49 | 0 49965 | 0 5 | 0 491 | 0 49 | 1 0 | 0 4 |
| 6          | 0 101 | 1 48819 | 1 4939 | 1 489  | 1 49 | 1 49965 | 1 5 | 1 491 | 1 49 | 2 0 | 1 4 |
| 7          | 0 104 | 48819   | 7186   | 0 714  | 0 71 | 2 49965 | 2 5 | 2 491 | 2 49 | 3   | 2 4 |
| 8          | 107   | 3 48819 | 1 7186 | 1 714  | 1 71 | 3 49965 | 0   | 3 491 | 3 49 | 0 5 | 3 4 |
| 9          | 0 110 | 0 93701 | 0 9433 | 0 938  | 0 94 | 0 9496  | 1 0 | 0 940 | 0 94 | 1 5 | 0 9 |
| 10         | 0 11  | 1 93701 | 0 1680 | 0 163  | 0 16 | 1 94962 | 2 0 | 1 940 | 1 94 | 5   | 1 9 |
| 11         | 0 115 | 2 93701 | 1 168  | 1 163  | 1 16 | 94962   | 3 0 | 2 94  | 2 94 | 0 0 | 9   |
| 12         | 118   | 38583   | 39 7   | 0 387  | 0 39 | 0 39958 | 4   | 0 389 | 39   | 1 0 | 0 3 |
| 13         | 0 121 | 1 38583 | 1 39 7 | 1 387  | 1 39 | 1 39958 | 1 4 | 1 389 | 1 39 | 0   | 1 3 |
| 14         | 0 1 3 | 38583   | 0 6174 | 0 61   | 0 61 | 39958   | 2 4 | 2 389 | 39   | 3 0 | 3   |
| 15         | 1 6   | 3 38583 | 1 6174 | 1 61   | 1 61 | 3 39958 | 3 4 | 3 389 | 3 39 | 0 5 | 3 3 |
| 16         | 0 129 | 0 83465 | 0 8421 | 0 836  | 0 84 | 0 84955 | 0 9 | 0 838 | 84   | 1 5 | 0 8 |
| 17         | 0 13  | 1 83465 | 0 668  | 0 061  | 0 06 | 1 84955 | 1 9 | 1 838 | 1 84 | 2 5 | 1 8 |
| 18         | 0 134 | 2 83465 | 1 0668 | 1 061  | 1 06 | 2 84955 | 9   | 2 838 | 2 84 | 0 0 | 2 8 |
| 19         | 0 137 | 0 28347 | 0 915  | 0 285  | 0 8  | 0 2995  | 0 3 | 0 287 | 0 8  | 1 0 | 0 2 |
| 20         | 0 140 | 1 8347  | 1 2915 | 1 285  | 1 28 | 1 2995  | 1 3 | 1 287 | 1 28 | 2 0 | 1 2 |
| 21         | 0 142 | 2 28347 | 0 5162 | 0 510  | 0 51 | 2 9952  | 2 3 | 2 287 | 2 8  | 3 0 | 2   |
| 22         | 0 145 | 3 28347 | 1 5162 | 1 510  | 1 51 | 3 29952 | 3 3 | 3 287 | 3 28 | 0 5 | 3   |



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 1              | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9      | 10   | 11   | 12    | 13   | 14   |
|----------------|------------|---------|------|------|-------|--------|-------|--------|------|------|-------|------|------|
| Day            | Mean Long. | A       | B    | C    | D     | E      | F     | G-J    | K    | L    | M     | N    | O    |
|                | °          | d       | d    | d    | d     | d      | d     | d      | d    | d    | d     | d    | d    |
| <b>Feb. 23</b> | 74°23713   | 4°64351 | 4°38 | 0°65 | 0°708 | 0°7287 | 0°731 | 54°00  | 0°92 | 1°52 | 1°502 | 1°50 | 0°25 |
| <b>24</b>      | 175°61189  | 5°64351 | 0°87 | 1°65 | 1°708 | 1°7287 | 1°731 | 55°00  | 0°16 | 2°52 | 2°502 | 2°50 | 1°25 |
| <b>25</b>      | 276°98665  | 6°64351 | 1°87 | 2°65 | 2°708 | 2°7287 | 2°731 | 56°00  | 1°16 | 0°02 | 0°002 | 0°00 | 2°25 |
| <b>26</b>      | 18°36142   | 0°59258 | 2°87 | 0°09 | 0°155 | 0°1772 | 0°180 | 57°00  | 0°39 | 1°02 | 1°002 | 1°00 | 3°25 |
| <b>27</b>      | 119°73618  | 1°59258 | 3°87 | 1°09 | 1°155 | 1°1772 | 1°180 | 58°00  | 1°39 | 2°02 | 2°002 | 2°00 | 0°67 |
| <b>28</b>      | 221°11094  | 2°59258 | 0°36 | 2°09 | 2°155 | 2°1772 | 2°180 | 59°00  | 0°62 | 3°02 | 3°002 | 3°00 | 1°67 |
| <b>Mar. 1</b>  | 322°48570  | 3°59258 | 1°36 | 3°09 | 3°155 | 3°1772 | 3°180 | 60°00  | 1°62 | 0°53 | 0°502 | 0°50 | 2°67 |
| <b>2</b>       | 63°86046   | 4°59258 | 2°36 | 0°54 | 0°602 | 0°6258 | 0°629 | 61°00  | 0°85 | 1°53 | 1°502 | 1°50 | 0°09 |
| <b>3</b>       | 165°23522  | 5°59258 | 3°36 | 1°54 | 1°602 | 1°6258 | 1°629 | 62°00  | 0°08 | 2°53 | 2°502 | 2°50 | 1°09 |
| <b>4</b>       | 266°60999  | 6°59258 | 4°36 | 2°54 | 2°602 | 2°6258 | 2°629 | 63°00  | 1°08 | 0°03 | 0°002 | 0°00 | 2°09 |
| <b>5</b>       | 7°98475    | 0°54166 | 0°84 | 3°54 | 0°049 | 0°0744 | 0°078 | 64°00  | 0°31 | 1°03 | 1°002 | 1°00 | 3°09 |
| <b>6</b>       | 109°35951  | 1°54166 | 1°84 | 0°98 | 1°049 | 1°0744 | 1°078 | 65°00  | 1°31 | 2°03 | 2°002 | 2°00 | 0°50 |
| <b>7</b>       | 210°73427  | 2°54166 | 2°84 | 1°98 | 2°049 | 2°0744 | 2°078 | 66°00  | 0°54 | 3°03 | 3°002 | 3°00 | 1°50 |
| <b>8</b>       | 312°10903  | 3°54166 | 3°84 | 2°98 | 3°049 | 3°0744 | 3°078 | 67°00  | 1°54 | 0°53 | 0°502 | 0°50 | 2°50 |
| <b>9</b>       | 53°48379   | 4°54166 | 0°33 | 0°42 | 0°496 | 0°5230 | 0°526 | 68°00  | 0°77 | 1°53 | 1°502 | 1°50 | 3°50 |
| <b>10</b>      | 154°85856  | 5°54166 | 1°33 | 1°42 | 1°496 | 1°5230 | 1°526 | 69°00  | 0°00 | 2°53 | 2°502 | 2°50 | 0°92 |
| <b>11</b>      | 256°23332  | 6°54166 | 2°33 | 2°42 | 2°496 | 2°5230 | 2°526 | 70°00  | 1°00 | 0°03 | 0°002 | 0°00 | 1°92 |
| <b>12</b>      | 357°60808  | 0°49073 | 3°33 | 3°42 | 3°496 | 3°5230 | 3°526 | 71°00  | 0°23 | 1°03 | 1°002 | 1°00 | 2°92 |
| <b>13</b>      | 98°98284   | 1°49073 | 4°33 | 0°87 | 0°943 | 0°9715 | 0°975 | 72°00  | 1°23 | 2°03 | 2°002 | 2°00 | 0°34 |
| <b>14</b>      | 200°35760  | 2°49073 | 0°82 | 1°87 | 1°943 | 1°9715 | 1°975 | 73°00  | 0°46 | 3°03 | 3°002 | 3°00 | 1°34 |
| <b>15</b>      | 301°73236  | 3°49073 | 1°82 | 2°87 | 2°943 | 2°9715 | 2°975 | 74°00  | 1°46 | 0°53 | 0°503 | 0°50 | 2°34 |
| <b>16</b>      | 43°10713   | 4°49073 | 2°82 | 0°31 | 0°391 | 0°4201 | 0°424 | 75°00  | 0°69 | 1°53 | 1°503 | 1°50 | 3°34 |
| <b>17</b>      | 144°48189  | 5°49073 | 3°82 | 1°31 | 1°391 | 1°4201 | 1°424 | 76°00  | 1°69 | 2°53 | 2°503 | 2°50 | 0°75 |
| <b>18</b>      | 245°85665  | 6°49073 | 0°31 | 2°31 | 2°391 | 2°4201 | 2°424 | 77°00  | 0°92 | 0°03 | 0°003 | 0°00 | 1°75 |
| <b>19</b>      | 347°23141  | 0°43980 | 1°31 | 3°31 | 3°391 | 3°4201 | 3°424 | 78°00  | 0°16 | 1°03 | 1°003 | 1°00 | 2°75 |
| <b>20</b>      | 88°60617   | 1°43980 | 2°31 | 0°75 | 0°838 | 0°8687 | 0°873 | 79°00  | 1°16 | 2°03 | 2°003 | 2°00 | 0°17 |
| <b>21</b>      | 189°98093  | 2°43980 | 3°31 | 1°75 | 1°838 | 1°8687 | 1°873 | 80°00  | 0°39 | 3°03 | 3°003 | 3°00 | 1°17 |
| <b>22</b>      | 291°35570  | 3°43980 | 4°31 | 2°75 | 2°838 | 2°8687 | 2°873 | 81°00  | 1°39 | 0°53 | 0°503 | 0°50 | 2°17 |
| <b>23</b>      | 32°73046   | 4°43980 | 0°80 | 0°20 | 0°285 | 0°3173 | 0°321 | 82°00  | 0°62 | 1°53 | 1°503 | 1°50 | 3°17 |
| <b>24</b>      | 134°10522  | 5°43980 | 1°80 | 1°20 | 1°285 | 1°3173 | 1°321 | 83°00  | 1°62 | 2°53 | 2°503 | 2°50 | 0°59 |
| <b>25</b>      | 235°47998  | 6°43980 | 2°80 | 2°20 | 2°285 | 2°3173 | 2°321 | 84°00  | 0°85 | 0°04 | 0°003 | 0°00 | 1°59 |
| <b>26</b>      | 336°85474  | 0°38887 | 3°80 | 3°20 | 3°285 | 3°3173 | 3°321 | 85°00  | 0°08 | 1°04 | 1°003 | 1°00 | 2°59 |
| <b>27</b>      | 78°22950   | 1°38887 | 0°29 | 0°64 | 0°732 | 0°7658 | 0°770 | 86°00  | 1°08 | 2°04 | 2°003 | 2°00 | 0°00 |
| <b>28</b>      | 179°60427  | 2°38887 | 1°29 | 1°64 | 1°732 | 1°7658 | 1°770 | 87°00  | 0°31 | 3°04 | 3°003 | 3°00 | 1°00 |
| <b>29</b>      | 280°97903  | 3°38887 | 2°29 | 2°64 | 2°732 | 2°7658 | 2°770 | 88°00  | 1°31 | 0°54 | 0°503 | 0°50 | 2°00 |
| <b>30</b>      | 22°35379   | 4°38887 | 3°29 | 0°08 | 0°179 | 0°2144 | 0°219 | 89°00  | 0°54 | 1°54 | 1°503 | 1°50 | 3°00 |
| <b>31</b>      | 123°72855  | 5°38887 | 4°29 | 1°08 | 1°179 | 1°2144 | 1°219 | 90°00  | 1°54 | 2°54 | 2°503 | 2°50 | 0°42 |
| <b>April 1</b> | 225°10331  | 6°38887 | 0°78 | 2°08 | 2°179 | 2°2144 | 2°219 | 91°00  | 0°77 | 0°04 | 0°003 | 0°00 | 1°42 |
| <b>2</b>       | 326°47807  | 0°33795 | 1°78 | 3°08 | 3°179 | 3°2144 | 3°219 | 92°00  | 0°00 | 1°04 | 1°003 | 1°00 | 2°42 |
| <b>3</b>       | 67°85284   | 1°33795 | 2°78 | 0°53 | 0°626 | 0°6630 | 0°668 | 93°00  | 1°00 | 2°04 | 2°003 | 2°00 | 3°42 |
| <b>4</b>       | 169°22760  | 2°33795 | 3°78 | 1°53 | 1°626 | 1°6630 | 1°668 | 94°00  | 0°23 | 3°04 | 3°003 | 3°00 | 0°84 |
| <b>5</b>       | 270°60236  | 3°33795 | 0°27 | 2°53 | 2°626 | 2°6630 | 2°668 | 95°00  | 1°23 | 0°54 | 0°503 | 0°50 | 1°84 |
| <b>6</b>       | 11°97712   | 4°33795 | 1°27 | 3°53 | 0°074 | 0°1116 | 0°116 | 96°00  | 0°46 | 1°54 | 1°503 | 1°50 | 2°84 |
| <b>7</b>       | 113°35188  | 5°33795 | 2°27 | 0°97 | 1°074 | 1°1116 | 1°116 | 97°00  | 1°46 | 2°54 | 2°503 | 2°50 | 0°25 |
| <b>8</b>       | 214°72664  | 6°33795 | 3°27 | 1°97 | 2°074 | 2°1116 | 2°116 | 98°00  | 0°69 | 0°04 | 0°003 | 0°00 | 1°25 |
| <b>9</b>       | 316°10141  | 0°28702 | 4°27 | 2°97 | 3°074 | 3°1116 | 3°116 | 99°00  | 1°69 | 1°04 | 1°003 | 1°00 | 2°25 |
| <b>10</b>      | 57°47617   | 1°28702 | 0°76 | 0°41 | 0°521 | 0°5601 | 0°565 | 100°00 | 0°93 | 2°04 | 2°003 | 2°00 | 3°25 |
| <b>11</b>      | 158°85093  | 2°28702 | 1°76 | 1°41 | 1°521 | 1°5601 | 1°565 | 101°00 | 0°16 | 3°04 | 3°003 | 3°00 | 0°67 |
| <b>12</b>      | 260°22569  | 3°28702 | 2°76 | 2°41 | 2°521 | 2°5601 | 2°565 | 102°00 | 1°16 | 0°54 | 0°503 | 0°50 | 1°67 |
| <b>13</b>      | 1°60045    | 4°28702 | 3°76 | 3°41 | 3°521 | 0°0087 | 0°014 | 103°00 | 0°39 | 1°54 | 1°503 | 1°50 | 2°67 |
| <b>14</b>      | 102°97521  | 5°28702 | 0°25 | 0°86 | 0°968 | 1°0087 | 1°014 | 104°00 | 1°39 | 2°54 | 2°503 | 2°50 | 0°09 |
| <b>15</b>      | 204°34998  | 6°28702 | 1°25 | 1°86 | 1°968 | 2°0087 | 2°014 | 105°00 | 0°62 | 0°04 | 0°004 | 0°00 | 1°09 |
| <b>16</b>      | 305°72474  | 0°23609 | 2°25 | 2°86 | 2°968 | 3°0087 | 3°014 | 106°00 | 1°62 | 1°04 | 1°004 | 1°00 | 2°09 |

In Leap Year diminish the date in Columns 1, 15, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

X continued Motions of Mean Longitude and the Arguments for Days

| 5              | 6     | 7       | 8      | 9     |      |         |     | 3     | 4    | 5   | 6   |
|----------------|-------|---------|--------|-------|------|---------|-----|-------|------|-----|-----|
| Day            | P     | Q       | R      | S     | T    | U       | V   | W     | X    | Y   | Z   |
| <b>Feb 23</b>  | 0 148 | 0 73228 | 0 7409 | 0 734 | 0 73 | 0 74948 | 0 8 | 0 736 | 73   | 1 5 | 0 6 |
| <b>24</b>      | 0 151 | 1 73 8  | 1 7409 | 1 734 | 1 73 | 1 74948 | 1 8 | 1 736 | 1 73 | 5   | 1 6 |
| <b>25</b>      | 0 153 | 732 8   | 0 9656 | 0 959 | 96   | 74948   | 8   | 736   | 2 73 | 0 0 | 2 6 |
| <b>26</b>      | 0 156 | 0 1811  | 0 1903 | 0 183 | 0 18 | 0 19945 | 0 3 | 185   | 0 18 | 1 0 | 0 1 |
| <b>27</b>      | 0 159 | 1 18110 | 1 19 3 | 1 183 | 1 18 | 1 19945 | 1 3 | 1 185 | 1 18 | 2 0 | 1 1 |
| <b>28</b>      | 16    | 181     | 0 4150 | 0 408 | 11   | 19945   | 2 3 | 2 185 | 18   | 3 0 | 2 1 |
| <b>Mar 1</b>   | 0 164 | 3 1811  | 1 4150 | 1 408 | 1 41 | 3 19945 | 3 3 | 3 185 | 3 18 | 0 5 | 3 1 |
| <b>2</b>       | 0 167 | 0 6 992 | 6397   | 0 632 | 63   | 0 64941 | 7   | 0 634 | 0 63 | 1 5 | 0 5 |
| <b>3</b>       | 0 170 | 1 6 99  | 1 6397 | 1 63  | 1 63 | 1 64941 | 1 7 | 1 634 | 1 63 | 5   | 1 5 |
| <b>4</b>       | 173   | 6 992   | 0 8644 | 0 856 | 0 85 | 2 64941 | 7   | 2 634 | 63   | 0 0 | 2 5 |
| <b>5</b>       | 0 175 | 0 7874  | 0 0891 | 0 081 | 8    | 0 09938 | 0   | 0 083 | 0 08 | 1 0 | 0 0 |
| <b>6</b>       | 0 178 | 1 07874 | 1 891  | 1 081 | 1 8  | 1 09938 | 1 2 | 1 083 | 1 08 | 2 0 | 1 0 |
| <b>7</b>       | 0 181 | 0 7874  | 3138   | 3 5   | 0 30 | 0 9938  | 2   | 2 083 | 2 08 | 3 0 | 0   |
| <b>8</b>       | 184   | 3 7874  | 1 3138 | 1 305 | 1 3  | 3 09938 | 3 2 | 3 083 | 3 08 | 0 5 | 3 0 |
| <b>9</b>       | 186   | 52756   | 0 5385 | 0 53  | 0 53 | 54934   | 6   | 0 532 | 0 53 | 1 5 | 0 4 |
| <b>10</b>      | 187   | 1 52756 | 1 5385 | 1 53  | 1 53 | 1 54934 | 1 6 | 1 53  | 1 53 | 2 5 | 1 4 |
| <b>11</b>      | 0 19  | 5 756   | 0 7631 | 0 754 | 0 75 | 2 54934 | 6   | 2 53  | 2 53 | 0 0 | 2 4 |
| <b>12</b>      | 0 195 | 3 52756 | 1 7631 | 1 754 | 1 75 | 3 54934 | 0 1 | 3 53  | 3 53 | 1 0 | 3 4 |
| <b>13</b>      | 197   | 0 97638 | 0 9878 | 0 979 | 0 98 | 0 99931 | 1 1 | 0 981 | 0 98 | 2 0 | 0 9 |
| <b>14</b>      | 0 00  | 1 97638 | 0 125  | 0 203 | 0 20 | 1 99931 | 2 1 | 1 981 | 1 98 | 3 0 | 1 9 |
| <b>15</b>      | 0 03  | 2 97638 | 1 1 5  | 1 03  | 1 20 | 99931   | 3 1 | 981   | 2 98 | 5   | 9   |
| <b>16</b>      | 0 5   | 0 425 0 | 0 437  | 4 8   | 0 43 | 0 44927 | 5   | 0 430 | 0 43 | 1 5 | 0 3 |
| <b>17</b>      | 8     | 1 4 5 0 | 1 4372 | 1 4 8 | 1 43 | 1 44927 | 1 5 | 1 430 | 1 43 | 2 5 | 1 3 |
| <b>18</b>      | 0 11  | 425     | 0 6619 | 0 652 | 0 65 | 2 449 7 | 2 5 | 430   | 43   | 0 0 | 2 3 |
| <b>19</b>      | 0 214 | 3 425 0 | 1 6619 | 1 652 | 1 65 | 3 449 7 | 0 0 | 3 430 | 3 43 | 1 0 | 3 3 |
| <b>20</b>      | 16    | 0 8740  | 8866   | 877   | 87   | 0 899 4 | 1 0 | 0 879 | 0 88 | 2 0 | 0 7 |
| <b>21</b>      | 19    | 1 87402 | 0 1113 | 0 101 | 0 1  | 1 89924 | 0   | 1 879 | 1 88 | 3 0 | 1 7 |
| <b>22</b>      | 0     | 2 874   | 1 1113 | 1 1 1 | 1 10 | 899 4   | 3 0 | 2 879 | 2 88 | 0 5 | 2 7 |
| <b>23</b>      | 0 5   | 0 32 84 | 0 3360 | 0 3 6 | 0 3  | 0 34920 | 0 4 | 0 3 8 | 0 32 | 1 5 | 0 2 |
| <b>24</b>      | 0 7   | 1 32284 | 1 3360 | 1 3 6 | 1 3  | 1 349   | 1 4 | 1 3 8 | 1 32 | 2 5 | 1 2 |
| <b>25</b>      | 0 30  | 2 3 284 | 0 56 7 | 0 550 | 0 55 | 34920   | 4   | 2 328 | 2 3  | 0 0 | 2   |
| <b>26</b>      | 0 33  | 3 3 284 | 1 56 7 | 1 55  | 1 55 | 3 34920 | 3 4 | 3 328 | 3 32 | 1 0 | 3   |
| <b>27</b>      | 0 36  | 0 77166 | 0 7854 | 0 775 | 0 77 | 0 79917 | 9   | 0 778 | 0 77 | 0   | 0 6 |
| <b>28</b>      | 0 38  | 1 77166 | 0 101  | 1 775 | 0 00 | 1 79917 | 1 9 | 1 778 | 1 77 | 3 0 | 1 6 |
| <b>29</b>      | 241   | 2 77166 | 1 0101 | 0 999 | 1 00 | 2 79917 | 2 9 | 778   | 2 77 | 0 5 | 2 6 |
| <b>30</b>      | 44    | 2 47    | 0 348  | 0 2 4 | 0 2  | 0 24913 | 0 3 | 0 2 7 | 0 22 | 1 5 | 0 1 |
| <b>31</b>      | 47    | 1 2 047 | 1 2348 | 1 2 4 | 1    | 1 24913 | 1 3 | 1 2 7 | 1 22 | 2 5 | 1 1 |
| <b>April 1</b> | 249   | 2 22047 | 0 4595 | 0 448 | 0 45 | 24913   | 2 3 | 2 227 | 2 22 | 0   | 2 1 |
| <b>2</b>       | 0 5   | 3 047   | 1 4595 | 1 448 | 1 45 | 3 24913 | 3 3 | 3 27  | 3 2  | 1 0 | 3 1 |
| <b>3</b>       | 0 55  | 0 669 9 | 0 6842 | 0 67  | 0 67 | 0 69910 | 0 8 | 0 676 | 0 67 | 2 0 | 0 5 |
| <b>4</b>       | 58    | 1 66929 | 1 684  | 1 67  | 1 67 | 1 69910 | 1 8 | 1 676 | 1 67 | 3 0 | 1 5 |
| <b>5</b>       | 0 6   | 669 9   | 0 9089 | 0 897 | 0 89 | 2 69910 | 2 8 | 2 676 | 2 67 | 0 5 | 2 5 |
| <b>6</b>       | 0 63  | 0 11811 | 0 1336 | 0 1 1 | 0 12 | 0 14907 | 0 2 | 0 125 | 0 12 | 1 5 | 0 0 |
| <b>7</b>       | 0 66  | 1 11811 | 1 1336 | 1 1 1 | 1 12 | 1 14907 | 1 2 | 1 125 | 1 12 | 2 5 | 1 0 |
| <b>8</b>       | 0 268 | 11811   | 3583   | 0 346 | 0 34 | 2 149 7 | 2 2 | 125   | 2 1  | 0 0 | 2 0 |
| <b>9</b>       | 0 71  | 3 11811 | 1 3583 | 1 346 | 1 34 | 3 14907 | 3 2 | 3 125 | 3 12 | 1 0 | 3 0 |
| <b>10</b>      | 0 274 | 56693   | 0 583  | 0 57  | 0 57 | 0 59903 | 0 7 | 0 574 | 0 57 | 2 0 | 0 4 |
| <b>11</b>      | 77    | 1 56693 | 1 5830 | 1 570 | 1 57 | 1 59903 | 1 7 | 1 574 | 1 57 | 3 0 | 1 4 |
| <b>12</b>      | 0 279 | 2 56693 | 0 8077 | 795   | 0 79 | 2 599 3 | 2 7 | 574   | 2 57 | 0 5 | 2 4 |
| <b>13</b>      | 0 282 | 01575   | 0 03 4 | 0 019 | 0 0  | 0 4900  | 0 2 | 0 023 | 0 0  | 1 5 | 3 4 |
| <b>14</b>      | 0 85  | 1 01575 | 1 03 4 | 1 019 | 1 0  | 1 0490  | 1 2 | 1 023 | 1 0  | 5   | 0 8 |
| <b>15</b>      | 0 88  | 2 01575 | 0 2571 | 0 44  | 0 4  | 0490    | 2   | 2 023 | 2 02 | 0 0 | 1 8 |
| <b>16</b>      | 290   | 3 01575 | 1 571  | 1 44  | 1 4  | 3 4900  | 3 2 | 3 023 | 3 02 | 1 0 | 2 8 |

I L p Y diml th d tel O l m s by ly ft F b 8



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 1               | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9      | 10   | 11   | 12    | 13   | 14   |
|-----------------|------------|---------|------|------|-------|--------|-------|--------|------|------|-------|------|------|
| Day             | Mean Long. | A       | B    | C    | D     | E      | F     | G-J    | K    | L    | M     | N    | O    |
|                 | °          | d       | d    | d    | d     | d      | d     | d      | d    | d    | d     | d    | d    |
| <b>April 17</b> | 47°09950   | 1°23609 | 3'25 | 0'30 | 0'415 | 0'4573 | 0'463 | 107°00 | 0'85 | 2'04 | 2'004 | 2'00 | 3'09 |
| <b>18</b>       | 148°47426  | 2°23609 | 4'25 | 1'30 | 1'415 | 1'4573 | 1'463 | 108°00 | 0'08 | 3'04 | 3'004 | 3'00 | 0'50 |
| <b>19</b>       | 249°84902  | 3°23609 | 0'73 | 2'30 | 2'415 | 2'4573 | 2'463 | 109°00 | 1'08 | 0'55 | 0'504 | 0'50 | 1'50 |
| <b>20</b>       | 351°22378  | 4°23609 | 1'73 | 3'30 | 3'415 | 3'4573 | 3'463 | 110°00 | 0'31 | 1'55 | 1'504 | 1'50 | 2'50 |
| <b>21</b>       | 92°59855   | 5°23609 | 2'73 | 0'74 | 0'862 | 0'9059 | 0'911 | 111°00 | 1'31 | 2'55 | 2'504 | 2'50 | 3'50 |
| <b>22</b>       | 193°97331  | 6°23609 | 3'73 | 1'74 | 1'862 | 1'9059 | 1'911 | 112°00 | 0'54 | 0'05 | 0'004 | 0'00 | 0'92 |
| <b>23</b>       | 295°34807  | 0°18517 | 0'22 | 2'74 | 2'862 | 2'9059 | 2'911 | 113°00 | 1'54 | 1'05 | 1'004 | 1'00 | 1'92 |
| <b>24</b>       | 36°72283   | 1°18517 | 1'22 | 0'18 | 0'309 | 0'3545 | 0'360 | 114°00 | 0'77 | 2'05 | 2'004 | 2'00 | 2'92 |
| <b>25</b>       | 138°09759  | 2°18517 | 2'22 | 1'18 | 1'309 | 1'3545 | 1'360 | 115°00 | 0'00 | 3'05 | 3'004 | 3'00 | 0'34 |
| <b>26</b>       | 239°47235  | 3°18517 | 3'22 | 2'18 | 2'309 | 2'3545 | 2'360 | 116°00 | 1'00 | 0'55 | 0'504 | 0'50 | 1'34 |
| <b>27</b>       | 340°84712  | 4°18517 | 4'22 | 3'18 | 3'309 | 3'3545 | 3'360 | 117°00 | 0'23 | 1'55 | 1'504 | 1'50 | 2'34 |
| <b>28</b>       | 82°22188   | 5°18517 | 0'71 | 0'63 | 0'757 | 0'8030 | 0'809 | 118°00 | 1'23 | 2'55 | 2'504 | 2'50 | 3'34 |
| <b>29</b>       | 183°59664  | 6°18517 | 1'71 | 1'63 | 1'757 | 1'8030 | 1'809 | 119°00 | 0'46 | 0'05 | 0'004 | 0'00 | 0'75 |
| <b>30</b>       | 284°97140  | 0°13424 | 2'71 | 2'63 | 2'757 | 2'8030 | 2'809 | 120°00 | 1'46 | 1'05 | 1'004 | 1'00 | 1'75 |
| <b>May 1</b>    | 26°34616   | 1°13424 | 3'71 | 0'07 | 0'204 | 0'2516 | 0'258 | 121°00 | 0'70 | 2'05 | 2'004 | 2'00 | 2'75 |
| <b>2</b>        | 127°72092  | 2°13424 | 0'20 | 1'07 | 1'204 | 1'2516 | 1'258 | 122°00 | 1'70 | 3'05 | 3'004 | 3'00 | 0'17 |
| <b>3</b>        | 229°09569  | 3°13424 | 1'20 | 2'07 | 2'204 | 2'2516 | 2'258 | 123°00 | 0'93 | 0'55 | 0'504 | 0'50 | 1'17 |
| <b>4</b>        | 330°47045  | 4°13424 | 2'20 | 3'07 | 3'204 | 3'2516 | 3'258 | 124°00 | 0'16 | 1'55 | 1'504 | 1'50 | 2'17 |
| <b>5</b>        | 71°84521   | 5°13424 | 3'20 | 0'51 | 0'651 | 0'7002 | 0'706 | 125°00 | 1'16 | 2'55 | 2'504 | 2'50 | 3'17 |
| <b>6</b>        | 173°21997  | 6°13424 | 4'20 | 1'51 | 1'651 | 1'7002 | 1'706 | 126°00 | 0'39 | 0'05 | 0'004 | 0'00 | 0'59 |
| <b>7</b>        | 274°59473  | 0°08331 | 0'69 | 2'51 | 2'651 | 2'7002 | 2'706 | 127°00 | 1'39 | 1'05 | 1'004 | 1'00 | 1'59 |
| <b>8</b>        | 15°96949   | 1°08331 | 1'69 | 3'51 | 0'098 | 0°1488 | 0°155 | 128°00 | 0'62 | 2'05 | 2'004 | 2'00 | 2'59 |
| <b>9</b>        | 117°34426  | 2°08331 | 2'69 | 0'96 | 1°098 | 1°1488 | 1°155 | 129°00 | 1'62 | 3'05 | 3'004 | 3'00 | 0°01 |
| <b>10</b>       | 218°71902  | 3°08331 | 3'69 | 1'96 | 2°098 | 2°1488 | 2°155 | 130°00 | 0'85 | 0'55 | 0'504 | 0'50 | 1°01 |
| <b>11</b>       | 320°09378  | 4°08331 | 0'18 | 2'96 | 3°098 | 3°1488 | 3°155 | 131°00 | 0'08 | 1'55 | 1'504 | 1'50 | 2°01 |
| <b>12</b>       | 61°46854   | 5°08331 | 1'18 | 0'40 | 0°545 | 0°5973 | 0°604 | 132°00 | 1'08 | 2'55 | 2'504 | 2'50 | 3°01 |
| <b>13</b>       | 162°84330  | 6°08331 | 2'18 | 1'40 | 1°545 | 1°5973 | 1°604 | 133°00 | 0'31 | 0'06 | 0°005 | 0°00 | 0°42 |
| <b>14</b>       | 264°21806  | 0°03238 | 3'18 | 2'40 | 2°545 | 2°5973 | 2°604 | 134°00 | 1'31 | 1'06 | 1°005 | 1'00 | 1°42 |
| <b>15</b>       | 5°59283    | 1°03238 | 4'18 | 3'40 | 3°545 | 0°0459 | 0°053 | 135°00 | 0'54 | 2'06 | 2°005 | 2'00 | 2°42 |
| <b>16</b>       | 106°96759  | 2°03238 | 0'67 | 0'84 | 0°992 | 1°0459 | 1°053 | 136°00 | 1'54 | 3'06 | 3°005 | 3'00 | 3°42 |
| <b>17</b>       | 208°34235  | 3°03238 | 1'67 | 1'84 | 1°992 | 2°0459 | 2°053 | 137°00 | 0'77 | 0'56 | 0°505 | 0°50 | 0°84 |
| <b>18</b>       | 309°71711  | 4°03238 | 2'67 | 2'84 | 2°992 | 3°0459 | 3°053 | 138°00 | 0°00 | 1'56 | 1°505 | 1'50 | 1°84 |
| <b>19</b>       | 51°09187   | 5°03238 | 3'67 | 0'29 | 0°440 | 0°4945 | 0°501 | 139°00 | 1'00 | 2'56 | 2°505 | 2'50 | 2°84 |
| <b>20</b>       | 152°46663  | 6°03238 | 0'16 | 1'29 | 1°440 | 1°4945 | 1°501 | 140°00 | 0'23 | 0'06 | 0°005 | 0°00 | 0°26 |
| <b>21</b>       | 253°84140  | 7°03238 | 1'16 | 2'29 | 2°440 | 2°4945 | 2°501 | 141°00 | 1'23 | 1'06 | 1°005 | 1'00 | 1°26 |
| <b>22</b>       | 355°21616  | 0°98146 | 2'16 | 3'29 | 3°440 | 3°4945 | 3°501 | 142°00 | 0'46 | 2'06 | 2°005 | 2'00 | 2°26 |
| <b>23</b>       | 96°59092   | 1°98146 | 3'16 | 0'73 | 0°887 | 0°9431 | 0°950 | 143°00 | 1'46 | 3'06 | 3°005 | 3'00 | 3°26 |
| <b>24</b>       | 197°96568  | 2°98146 | 4'16 | 1'73 | 1°887 | 1°9431 | 1°950 | 144°00 | 0'70 | 0'56 | 0°505 | 0°50 | 0°67 |
| <b>25</b>       | 299°34044  | 3°98146 | 0'65 | 2'73 | 2°887 | 2°9431 | 2°950 | 145°00 | 1'70 | 1'56 | 1°505 | 1'50 | 1°67 |
| <b>26</b>       | 40°71520   | 4°98146 | 1'65 | 0'17 | 0°334 | 0°3916 | 0°399 | 146°00 | 0'93 | 2'56 | 2°505 | 2'50 | 2°67 |
| <b>27</b>       | 142°08997  | 5°98146 | 2'65 | 1'17 | 1°334 | 1°3916 | 1°399 | 147°00 | 0'16 | 0'06 | 0°005 | 0°00 | 0°09 |
| <b>28</b>       | 243°46473  | 6°98146 | 3'65 | 2'17 | 2°334 | 2°3916 | 2°399 | 148°00 | 1'16 | 1'06 | 1°005 | 1'00 | 1°09 |
| <b>29</b>       | 344°83949  | 0°93053 | 0'13 | 3'17 | 3°334 | 3°3916 | 3°399 | 149°00 | 0'39 | 2'06 | 2°005 | 2'00 | 2°09 |
| <b>30</b>       | 86°21425   | 1°93053 | 1'13 | 0'62 | 0°781 | 0°8402 | 0°848 | 150°00 | 1'39 | 3'06 | 3°005 | 3'00 | 3°09 |
| <b>31</b>       | 187°58901  | 2°93053 | 2'13 | 1'62 | 1°781 | 1°8402 | 1°848 | 151°00 | 0'62 | 0'56 | 0°505 | 0°50 | 0°51 |
| <b>June 1</b>   | 288°96377  | 3°93053 | 3'13 | 2'62 | 2°781 | 2°8402 | 2°848 | 152°00 | 1'62 | 1'56 | 1°505 | 1'50 | 1°51 |
| <b>2</b>        | 30°33854   | 4°93053 | 4'13 | 0'06 | 0°228 | 0°2888 | 0°296 | 153°00 | 0'85 | 2'56 | 2°505 | 2'50 | 2°51 |
| <b>3</b>        | 131°71330  | 5°93053 | 0'62 | 1'06 | 1°228 | 1°2888 | 1°296 | 154°00 | 0'08 | 0'07 | 0°005 | 0°00 | 3°51 |
| <b>4</b>        | 233°08806  | 6°93053 | 1'62 | 2'06 | 2°228 | 2°2888 | 2°296 | 155°00 | 1'08 | 1'07 | 1°005 | 1'00 | 0°92 |
| <b>5</b>        | 334°46282  | 0°87960 | 2'62 | 3'06 | 3°228 | 3°2888 | 3°296 | 156°00 | 0'31 | 2'07 | 2°005 | 2'00 | 1°92 |
| <b>6</b>        | 75°83758   | 1°87960 | 3'62 | 0'50 | 0°675 | 0°7374 | 0°745 | 157°00 | 1'31 | 3'07 | 3°005 | 3'00 | 2°92 |
| <b>7</b>        | 177°21234  | 2°87960 | 0'11 | 1'50 | 1°675 | 1°7374 | 1°745 | 158°00 | 0'54 | 0'57 | 0°505 | 0°50 | 0°34 |

In Leap Year diminish the date in Columns 1, 15, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 5             | 6     | 7       | 8      | 9     |      |         |     | 3     | 4    | 5   | 6   |
|---------------|-------|---------|--------|-------|------|---------|-----|-------|------|-----|-----|
| D y           | P     | Q       | R      | S     | T    | U       | V   | W     | X    | Y   | Z   |
| <b>Apr 1</b>  | 0 293 | 0 46457 | 0 4818 | 0 468 | 0 47 | 49896   | 0 6 | 0 472 | a    | a   | a   |
| <b>17</b>     | 0 293 | 0 46457 | 0 4818 | 0 468 | 0 47 | 49896   | 0 6 | 0 472 | 0 47 | 2 0 | 0 3 |
| <b>18</b>     | 0 296 | 1 46457 | 1 4818 | 1 468 | 1 47 | 1 49896 | 1 6 | 1 47  | 1 47 | 3 0 | 1 3 |
| <b>19</b>     | 0 299 | 2 46457 | 7 065  | 693   | 0 69 | 49896   | 2 6 | 47    | 2 47 | 0 5 | 3   |
| <b>20</b>     | 0 301 | 3 46457 | 1 7 65 | 1 693 | 1 69 | 3 49896 | 0 1 | 3 472 | 3 47 | 1 5 | 3 3 |
| <b>21</b>     | 0 304 | 0 91339 | 0 931  | 0 917 | 0 91 | 0 94893 | 1 1 | 0 921 | 0 92 | 2 5 | 0 7 |
| <b>22</b>     | 0 307 | 1 91339 | 0 1559 | 0 142 | 0 14 | 1 94893 | 1   | 1 9 1 | 1 9  | 0   | 1 7 |
| <b>23</b>     | 0 310 | 2 91339 | 1 1559 | 1 142 | 1 14 | 2 94893 | 3 1 | 2 9 1 | 2 92 | 1 0 | 2 7 |
| <b>24</b>     | 0 31  | 0 36 1  | 0 3806 | 0 366 | 0 36 | 0 39889 | 0 5 | 0 370 | 0 36 | 2   | 0 2 |
| <b>25</b>     | 3 5   | 1 36 1  | 1 3806 | 1 366 | 1 36 | 1 39889 | 1 5 | 1 370 | 1 36 | 3   | 1 2 |
| <b>26</b>     | 0 318 | 36221   | 0 605  | 591   | 0 59 | 2 39889 | 2 5 | 370   | 36   | 0 5 | 2   |
| <b>27</b>     | 3 1   | 3 36221 | 1 6052 | 1 591 | 1 59 | 3 39889 | 0 0 | 3 370 | 3 36 | 1 5 | 3 2 |
| <b>28</b>     | 3 3   | 0 81103 | 0 8 99 | 0 815 | 0 81 | 0 84886 | 1 0 | 0 819 | 81   | 2 5 | 0 6 |
| <b>29</b>     | 0 3 6 | 1 81103 | 0 0546 | 0 040 | 0 4  | 1 84886 | 0   | 1 819 | 1 81 | 0   | 1 6 |
| <b>30</b>     | 0 329 | 2 81103 | 1 0546 | 1 040 | 1 4  | 84886   | 3 0 | 2 819 | 2 81 | 1 0 | 2 6 |
| <b>May 1</b>  | 0 332 | 0 25985 | 0 793  | 0 64  | 0 6  | 0 2988  | 0 4 | 0 68  | 0 26 | 2 0 | 0 1 |
| <b>2</b>      | 0 334 | 1 25985 | 1 793  | 1 264 | 1 6  | 1 2988  | 1 4 | 1 268 | 1 26 | 3 0 | 1 1 |
| <b>3</b>      | 0 337 | 2 25985 | 0 5040 | 0 488 | 0 49 | 2 2988  | 4   | 2 268 | 6    | 0 5 | 2 1 |
| <b>4</b>      | 0 340 | 3 5985  | 1 5040 | 1 488 | 1 49 | 3 9882  | 3 4 | 3 268 | 3 6  | 1 5 | 3 1 |
| <b>5</b>      | 0 34  | 0 7 866 | 0 7 87 | 0 713 | 0 71 | 0 74879 | 0 9 | 0 717 | 0 71 | 2 5 | 0 5 |
| <b>6</b>      | 0 345 | 1 70866 | 1 7287 | 1 713 | 1 71 | 1 74879 | 1 9 | 1 717 | 1 71 | 0 0 | 1 5 |
| <b>7</b>      | 0 348 | 70866   | 0 9534 | 0 937 | 0 93 | 2 74879 | 9   | 2 717 | 2 71 | 1 0 | 2 5 |
| <b>8</b>      | 0 351 | 15748   | 0 1781 | 0 16  | 0 16 | 0 19875 | 0 3 | 0 166 | 0 16 | 2 0 | 3 5 |
| <b>9</b>      | 0 353 | 1 15748 | 1 1781 | 1 162 | 1 16 | 1 19875 | 1 3 | 1 166 | 1 16 | 3 0 | 0 9 |
| <b>10</b>     | 0 356 | 15748   | 0 40 8 | 0 386 | 0 38 | 2 19875 | 2 3 | 2 166 | 16   | 0 5 | 1 9 |
| <b>11</b>     | 0 359 | 3 15748 | 1 4028 | 1 386 | 1 38 | 3 19875 | 3 3 | 3 166 | 3 16 | 1 5 | 9   |
| <b>12</b>     | 0 36  | 0 60630 | 0 6275 | 0 611 | 61   | 0 64872 | 0 8 | 0 615 | 0 61 | 2 5 | 0 4 |
| <b>13</b>     | 0 364 | 1 60630 | 1 6275 | 1 611 | 1 61 | 1 64872 | 1 8 | 1 615 | 1 61 | 0 0 | 1 4 |
| <b>14</b>     | 0 367 | 60630   | 0 852  | 0 835 | 0 83 | 2 6487  | 8   | 2 615 | 61   | 1   | 2 4 |
| <b>15</b>     | 370   | 0 05512 | 0 0769 | 0 060 | 0 06 | 0 09869 | 0 2 | 0 064 | 0 06 | 2 0 | 3 4 |
| <b>16</b>     | 373   | 1 551   | 1 0769 | 1 060 | 1 6  | 1 09869 | 1   | 1 064 | 1 06 | 3 0 | 0 8 |
| <b>17</b>     | 0 375 | 2 05512 | 0 3016 | 0 284 | 0 8  | 0 09869 |     | 0 64  | 2 06 | 0 5 | 1 8 |
| <b>18</b>     | 0 378 | 3 05512 | 1 3016 | 1 84  | 1 28 | 3 09869 | 3 2 | 3 064 | 3 06 | 1 5 | 2 8 |
| <b>19</b>     | 381   | 0 50394 | 0 5 63 | 0 509 | 51   | 0 54865 | 0 7 | 0 514 | 0 51 | 2 5 | 3   |
| <b>20</b>     | 384   | 1 50394 | 1 5263 | 1 509 | 1 51 | 1 54865 | 1 7 | 1 514 | 1 51 | 0 0 | 1 3 |
| <b>21</b>     | 0 386 | 2 50394 | 0 7510 | 0 733 | 0 73 | 2 54865 | 7   | 2 514 | 2 51 | 1 0 | 2 3 |
| <b>22</b>     | 0 389 | 3 50394 | 1 7510 | 1 733 | 1 73 | 3 54865 | 0 1 | 3 514 | 3 51 | 0   | 3 3 |
| <b>23</b>     | 39    | 95 76   | 0 9757 | 0 958 | 0 95 | 0 99862 | 1 1 | 0 963 | 0 96 | 3 0 | 0 7 |
| <b>24</b>     | 0 395 | 1 95 76 | 0 004  | 0 182 | 0 18 | 1 9986  | 1   | 1 963 | 1 96 | 0 5 | 1 7 |
| <b>25</b>     | 0 397 | 2 95 76 | 1 2004 | 1 182 | 1 18 | 2 9986  | 3 1 | 963   | 96   | 1 5 | 2 7 |
| <b>26</b>     | 0 400 | 0 40158 | 0 4251 | 0 407 | 0 4  | 0 44858 | 0 6 | 0 41  | 0 40 | 2 5 | 0 2 |
| <b>27</b>     | 0 403 | 1 40158 | 1 4251 | 1 407 | 1 40 | 1 44858 | 1 6 | 1 412 | 1 40 | 3 5 | 1 2 |
| <b>28</b>     | 405   | 2 40158 | 0 6498 | 631   | 0 63 | 44858   | 2 6 | 2 412 | 2 40 | 0 9 | 2 2 |
| <b>29</b>     | 0 4 8 | 3 40158 | 1 6498 | 1 631 | 1 63 | 3 44858 | 0 0 | 3 41  | 3 40 | 1 9 | 3 2 |
| <b>30</b>     | 0 411 | 0 8504  | 0 8745 | 0 856 | 0 85 | 0 89855 | 1 0 | 0 861 | 0 85 | 2 9 | 0 6 |
| <b>31</b>     | 414   | 1 85040 | 0 992  | 0 080 | 0 08 | 1 89855 | 0   | 1 861 | 1 85 | 0 4 | 1 6 |
| <b>June 1</b> | 0 416 | 85040   | 1 0992 | 1 08  | 1 08 | 2 89855 | 3 0 | 2 861 | 85   | 1 4 | 6   |
| <b>2</b>      | 0 419 | 0 99    | 0 3 39 | 304   | 0 3  | 0 34851 | 0 5 | 0 310 | 0 30 | 4   | 0 0 |
| <b>3</b>      | 0 4   | 1 2992  | 1 3 39 | 1 304 | 1 30 | 1 34851 | 1 5 | 1 310 | 1 30 | 3 4 | 1 0 |
| <b>4</b>      | 0 425 | 2 2992  | 0 5486 | 0 529 | 0 52 | 34851   | 5   | 310   | 30   | 0 9 | 2 0 |
| <b>5</b>      | 0 427 | 3 29922 | 1 5486 | 1 529 | 1 5  | 3 34851 | 0   | 3 310 | 3 30 | 1 9 | 3   |
| <b>6</b>      | 0 430 | 0 74804 | 0 7733 | 0 753 | 0 75 | 0 79848 | 1 0 | 0 759 | 0 75 | 9   | 0 5 |
| <b>7</b>      | 0 433 | 1 74804 | 1 7733 | 1 753 | 1 75 | 1 79848 | 2 0 | 1 759 | 1 75 | 0 4 | 1 5 |

I L p Y d m i h t l d t i O l m s by d y f t F b 8

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 1             | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9      | 10   | 11   | 12    | 13   | 14   |
|---------------|------------|---------|------|------|-------|--------|-------|--------|------|------|-------|------|------|
| Day           | Mean Long. | A       | B    | C    | D     | E      | F     | G-J    | K    | L    | M     | N    | O    |
|               |            | d       | d    | d    | d     | d      | d     | d      | d    | d    | d     | d    | d    |
| <b>June 8</b> | 278°58711  | 3°87960 | 1°11 | 2°50 | 2°675 | 2°7374 | 2°745 | 159°00 | 1°55 | 1°57 | 1°505 | 1°50 | 1°34 |
| <b>9</b>      | 19°96187   | 4°87960 | 2°11 | 3°50 | 0°123 | 0°1860 | 0°194 | 160°00 | 0°78 | 2°57 | 2°505 | 2°50 | 2°34 |
| <b>10</b>     | 121°33663  | 5°87960 | 3°11 | 0°95 | 1°123 | 1°1860 | 1°194 | 161°00 | 0°01 | 0°07 | 0°005 | 0°00 | 3°34 |
| <b>11</b>     | 222°71139  | 6°87960 | 4°11 | 1°95 | 2°123 | 2°1860 | 2°194 | 162°00 | 1°01 | 1°07 | 1°005 | 1°00 | 0°76 |
| <b>12</b>     | 324°08615  | 0°82868 | 0°60 | 2°95 | 3°123 | 3°1860 | 3°194 | 163°00 | 0°24 | 2°07 | 2°005 | 2°00 | 1°76 |
| <b>13</b>     | 65°46091   | 1°82868 | 1°60 | 0°39 | 0°570 | 0°6345 | 0°643 | 164°00 | 1°24 | 3°07 | 3°005 | 3°00 | 2°76 |
| <b>14</b>     | 166°83568  | 2°82868 | 2°60 | 1°39 | 1°570 | 1°6345 | 1°643 | 165°00 | 0°47 | 0°57 | 0°506 | 0°50 | 0°17 |
| <b>15</b>     | 268°21044  | 3°82868 | 3°60 | 2°39 | 2°570 | 2°6345 | 2°643 | 166°00 | 1°47 | 1°57 | 1°506 | 1°50 | 1°17 |
| <b>16</b>     | 9°58520    | 4°82868 | 0°09 | 3°39 | 0°017 | 0°0831 | 0°091 | 167°00 | 0°70 | 2°57 | 2°506 | 2°50 | 2°17 |
| <b>17</b>     | 110°95996  | 5°82868 | 1°09 | 0°83 | 1°017 | 1°0831 | 1°091 | 168°00 | 1°70 | 0°07 | 0°006 | 0°00 | 3°17 |
| <b>18</b>     | 212°33472  | 6°82868 | 2°09 | 1°83 | 2°017 | 2°0831 | 2°091 | 169°00 | 0°93 | 1°07 | 1°006 | 1°00 | 0°59 |
| <b>19</b>     | 313°70948  | 0°77775 | 3°09 | 2°83 | 3°017 | 3°0831 | 3°091 | 170°00 | 0°16 | 2°07 | 2°006 | 2°00 | 1°59 |
| <b>20</b>     | 55°08425   | 1°77775 | 4°09 | 0°28 | 0°464 | 0°5317 | 0°540 | 171°00 | 1°16 | 3°07 | 3°006 | 3°00 | 2°59 |
| <b>21</b>     | 156°45901  | 2°77775 | 0°58 | 1°28 | 1°464 | 1°5317 | 1°540 | 172°00 | 0°39 | 0°57 | 0°506 | 0°50 | 0°01 |
| <b>22</b>     | 257°83377  | 3°77775 | 1°58 | 2°28 | 2°464 | 2°5317 | 2°540 | 173°00 | 1°39 | 1°57 | 1°506 | 1°50 | 1°01 |
| <b>23</b>     | 359°20853  | 4°77775 | 2°58 | 3°28 | 3°464 | 3°5317 | 3°540 | 174°00 | 0°62 | 2°57 | 2°506 | 2°50 | 2°01 |
| <b>24</b>     | 100°58329  | 5°77775 | 3°58 | 0°72 | 0°911 | 0°9803 | 0°989 | 175°00 | 1°62 | 0°07 | 0°006 | 0°00 | 3°01 |
| <b>25</b>     | 201°95805  | 6°77775 | 0°07 | 1°72 | 1°911 | 1°9803 | 1°989 | 176°00 | 0°85 | 1°07 | 1°006 | 1°00 | 0°42 |
| <b>26</b>     | 303°33282  | 0°72682 | 1°07 | 2°72 | 2°911 | 2°9803 | 2°989 | 177°00 | 0°09 | 2°07 | 2°006 | 2°00 | 1°42 |
| <b>27</b>     | 44°70758   | 1°72682 | 2°07 | 0°16 | 0°358 | 0°4288 | 0°438 | 178°00 | 1°09 | 3°07 | 3°006 | 3°00 | 2°42 |
| <b>28</b>     | 146°08234  | 2°72682 | 3°07 | 1°16 | 1°358 | 1°4288 | 1°438 | 179°00 | 0°32 | 0°58 | 0°506 | 0°50 | 3°42 |
| <b>29</b>     | 247°45710  | 3°72682 | 4°07 | 2°16 | 2°358 | 2°4288 | 2°438 | 180°00 | 1°32 | 1°58 | 1°506 | 1°50 | 0°84 |
| <b>30</b>     | 348°83186  | 4°72682 | 0°56 | 3°16 | 3°358 | 3°4288 | 3°438 | 181°00 | 0°55 | 2°58 | 2°506 | 2°50 | 1°84 |
| <b>July 1</b> | 90°20662   | 5°72682 | 1°56 | 0°61 | 0°806 | 0°8774 | 0°886 | 182°00 | 1°55 | 0°08 | 0°006 | 0°00 | 2°84 |
| <b>2</b>      | 191°58139  | 6°72682 | 2°56 | 1°61 | 1°806 | 1°8774 | 1°886 | 183°00 | 0°78 | 1°08 | 1°006 | 1°00 | 0°26 |
| <b>3</b>      | 292°95615  | 0°67589 | 3°56 | 2°61 | 2°806 | 2°8774 | 2°886 | 184°00 | 0°01 | 2°08 | 2°006 | 2°00 | 1°26 |
| <b>4</b>      | 34°33091   | 1°67589 | 0°05 | 0°05 | 0°253 | 0°3260 | 0°335 | 185°00 | 1°01 | 3°08 | 3°006 | 3°00 | 2°26 |
| <b>5</b>      | 135°70567  | 2°67589 | 1°05 | 1°05 | 1°253 | 1°3260 | 1°335 | 186°00 | 0°24 | 0°58 | 0°506 | 0°50 | 3°26 |
| <b>6</b>      | 237°08043  | 3°67589 | 2°05 | 2°05 | 2°253 | 2°3260 | 2°335 | 187°00 | 1°24 | 1°58 | 1°506 | 1°50 | 0°67 |
| <b>7</b>      | 338°45519  | 4°67589 | 3°05 | 3°05 | 3°253 | 3°3260 | 3°335 | 188°00 | 0°47 | 2°58 | 2°506 | 2°50 | 1°67 |
| <b>8</b>      | 79°82996   | 5°67589 | 4°05 | 0°49 | 0°700 | 0°7746 | 0°784 | 189°00 | 1°47 | 0°08 | 0°006 | 0°00 | 2°67 |
| <b>9</b>      | 181°20472  | 6°67589 | 0°53 | 1°49 | 1°700 | 1°7746 | 1°784 | 190°00 | 0°70 | 1°08 | 1°006 | 1°00 | 0°09 |
| <b>10</b>     | 282°57948  | 0°62497 | 1°53 | 2°49 | 2°700 | 2°7746 | 2°784 | 191°00 | 1°70 | 2°08 | 2°006 | 2°00 | 1°09 |
| <b>11</b>     | 23°95424   | 1°62497 | 2°53 | 3°49 | 0°147 | 0°2231 | 0°233 | 192°00 | 0°93 | 3°08 | 3°006 | 3°00 | 2°09 |
| <b>12</b>     | 125°32900  | 2°62497 | 3°53 | 0°94 | 1°147 | 1°2231 | 1°233 | 193°00 | 0°16 | 0°58 | 0°507 | 0°50 | 3°09 |
| <b>13</b>     | 226°70376  | 3°62497 | 0°02 | 1°94 | 2°147 | 2°2231 | 2°233 | 194°00 | 1°16 | 1°58 | 1°507 | 1°50 | 0°51 |
| <b>14</b>     | 328°07853  | 4°62497 | 1°02 | 2°94 | 3°147 | 3°2231 | 3°233 | 195°00 | 0°39 | 2°58 | 2°507 | 2°50 | 1°51 |
| <b>15</b>     | 69°45329   | 5°62497 | 2°02 | 0°38 | 0°594 | 0°6717 | 0°681 | 196°00 | 1°39 | 0°08 | 0°007 | 0°00 | 2°51 |
| <b>16</b>     | 170°82805  | 6°62497 | 3°02 | 1°38 | 1°594 | 1°6717 | 1°681 | 197°00 | 0°62 | 1°08 | 1°007 | 1°00 | 3°51 |
| <b>17</b>     | 272°20281  | 0°57404 | 4°02 | 2°38 | 2°594 | 2°6717 | 2°681 | 198°00 | 1°62 | 2°08 | 2°007 | 2°00 | 0°92 |
| <b>18</b>     | 13°57757   | 1°57404 | 0°51 | 3°38 | 0°041 | 0°1203 | 0°130 | 199°00 | 0°86 | 3°08 | 3°007 | 3°00 | 1°92 |
| <b>19</b>     | 114°95233  | 2°57404 | 1°51 | 0°82 | 1°041 | 1°1203 | 1°130 | 200°00 | 0°09 | 0°58 | 0°507 | 0°50 | 2°92 |
| <b>20</b>     | 216°32710  | 3°57404 | 2°51 | 1°82 | 2°041 | 2°1203 | 2°130 | 201°00 | 1°09 | 1°58 | 1°507 | 1°50 | 0°34 |
| <b>21</b>     | 317°70186  | 4°57404 | 3°51 | 2°82 | 3°041 | 3°1203 | 3°130 | 202°00 | 0°32 | 2°58 | 2°507 | 2°50 | 1°34 |
| <b>22</b>     | 59°07662   | 5°57404 | 0°00 | 0°27 | 0°489 | 0°5689 | 0°579 | 203°00 | 1°32 | 0°09 | 0°007 | 0°00 | 2°34 |
| <b>23</b>     | 160°45138  | 6°57404 | 1°00 | 1°27 | 1°489 | 1°5689 | 1°579 | 204°00 | 0°55 | 1°09 | 1°007 | 1°00 | 3°34 |
| <b>24</b>     | 261°82614  | 0°52311 | 2°00 | 2°27 | 2°489 | 2°5689 | 2°579 | 205°00 | 1°55 | 2°09 | 2°007 | 2°00 | 0°76 |
| <b>25</b>     | 3°20090    | 1°52311 | 3°00 | 3°27 | 3°489 | 0°0175 | 0°028 | 206°00 | 0°78 | 3°09 | 3°007 | 3°00 | 1°76 |
| <b>26</b>     | 104°57567  | 2°52311 | 4°00 | 0°71 | 0°936 | 1°0175 | 1°028 | 207°00 | 0°01 | 0°59 | 0°507 | 0°50 | 2°76 |
| <b>27</b>     | 205°95043  | 3°52311 | 0°49 | 1°71 | 1°936 | 2°0175 | 2°028 | 208°00 | 1°01 | 1°59 | 1°507 | 1°50 | 0°17 |
| <b>28</b>     | 307°32519  | 4°52311 | 1°49 | 2°71 | 2°936 | 3°0175 | 3°028 | 209°00 | 0°24 | 2°59 | 2°507 | 2°50 | 1°17 |
| <b>29</b>     | 48°69995   | 5°52311 | 2°49 | 0°15 | 0°383 | 0°4660 | 0°476 | 210°00 | 1°24 | 0°09 | 0°007 | 0°00 | 2°17 |

In Leap Year diminish the date in Columns 1, 15, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 5             | 6     | 7                  | 8      | 9                  |      |         |     | 3     | 4    | 5   | 6   |
|---------------|-------|--------------------|--------|--------------------|------|---------|-----|-------|------|-----|-----|
| D y           | P     | Q                  | R      | S                  | T    | U       | V   | W     | X    | Y   | Z   |
| <b>June 8</b> | 0 436 | <sup>d</sup> 74804 | 0 9980 | <sup>d</sup> 0 978 | 0 97 | 79848   | 3   | 759   | 75   | 1 4 | 2 5 |
| <b>9</b>      | 0 438 | 19685              | 27     |                    | 0 20 | 4844    | 4   | 0 08  | 0 0  | 2 4 | 3 5 |
| <b>10</b>     | 0 441 | 19685              | 1 27   | 1 2                | 1 2  | 1 4844  | 1 4 | 1 08  | 1 0  | 3 4 | 0 9 |
| <b>11</b>     | 0 444 | 19685              | 4473   | 4 7                | 0 42 | 2 24844 | 2 4 | 2 08  |      | 0 9 | 1 9 |
| <b>12</b>     | 0 447 | 3 19685            | 1 4473 | 1 4 7              | 1 4  | 3 4844  | 3 4 | 3 08  | 3    | 1 9 | 9   |
| <b>13</b>     | 0 449 | 64567              | 6720   | 651                | 0 65 | 0 69841 | 0 9 | 0 657 | 0 65 | 9   | 0 4 |
| <b>14</b>     | 45    | 1 64567            | 1 67   | 1 65               | 1 65 | 1 69841 | 1 9 | 1 657 | 1 65 | 0 4 | 1 4 |
| <b>15</b>     | 455   | 64567              | 0 8967 | 0 876              | 0 87 | 69841   | 9   | 657   | 2 65 | 1 4 | 4   |
| <b>16</b>     | 0 458 | 0 9449             | 1 14   | 0 10               | 0 1  | 14837   | 0 3 | 0 106 | 10   | 2 4 | 3 4 |
| <b>17</b>     | 0 460 | 1 9449             | 1 1 14 | 1 1 0              | 1 10 | 1 14837 | 1 3 | 1 106 | 1 10 | 3 4 | 0 8 |
| <b>18</b>     | 463   | 2 09449            | 3461   | 0 3 5              | 32   | 14837   | 3   | 2 106 | 2 10 | 0 9 | 1 8 |
| <b>19</b>     | 0 466 | 3 9449             | 1 3461 | 1 3 5              | 1 32 | 3 14837 | 3 3 | 3 106 | 3 10 | 1 9 | 2 8 |
| <b>20</b>     | 0 468 | 54331              | 0 57 8 | 0 549              | 0 54 | 0 59834 | 0 8 | 0 555 | 55   | 9   | 0 3 |
| <b>21</b>     | 0 471 | 1 54331            | 57 8   | 1 549              | 1 54 | 1 59834 | 1 8 | 1 555 | 1 55 | 0 4 | 1 3 |
| <b>22</b>     | 0 474 | 54331              | 0 7955 | 0 774              | 0 77 | 2 59834 | 2 8 | 555   | 55   | 1 4 | 3   |
| <b>23</b>     | 477   | 3 54331            | 0      | 1 774              | 1 77 | 0 04830 | 0   | 0 0 4 | 0 0  | 2 4 | 3 3 |
| <b>24</b>     | 0 479 | 0 99 13            | 1 020  | 0 998              | 0 99 | 1 0483  | 1 2 | 1 004 | 1 00 | 3 4 | 0 7 |
| <b>25</b>     | 0 482 | 1 99 13            | 0 449  | 0 23               | 0    | 2 04830 | 2   | 2 004 | 2 00 | 0 9 | 1 7 |
| <b>26</b>     | 0 485 | 2 99 13            | 1 449  | 1 2 3              | 1 2  | 3 0483  | 3 2 | 3 004 | 3 0  | 1 9 | 2 7 |
| <b>27</b>     | 488   | 0 44095            | 0 4696 | 0 447              | 44   | 0 49827 | 0 7 | 0 453 | 0 44 | 9   | 0 1 |
| <b>28</b>     | 0 490 | 1 44095            | 1 4696 | 1 447              | 1 44 | 1 498 7 | 1 7 | 1 453 | 1 44 | 0 4 | 1 1 |
| <b>29</b>     | 0 493 | 2 44095            | 0 6943 | 0 672              | 0 67 | 2 498 7 | 2 7 | 2 453 | 44   | 1 4 | 2 1 |
| <b>30</b>     | 0 496 | 3 44 95            | 1 6943 | 1 67               | 1 67 | 3 498 7 | 1   | 3 453 | 3 44 | 2 4 | 3 1 |
| <b>July 1</b> | 499   | 0 88977            | 9190   | 0 896              | 0 89 | 0 948 4 | 1 1 | 0 90  | 89   | 3 4 | 0 6 |
| <b>2</b>      | 0 501 | 1 88977            | 1437   | 1 1                | 0 1  | 1 948 4 | 1   | 1 90  | 1 89 | 0 9 | 1 6 |
| <b>3</b>      | 0 504 | 2 88977            | 1 1437 | 1 1                | 1 1  | 948 4   | 3 1 | 9     | 89   | 1 9 | 6   |
| <b>4</b>      | 0 5 7 | 0 33859            | 0 3684 | 0 345              | 0 34 | 0 3982  | 0 6 | 0 351 | 0 34 | 9   | 0 0 |
| <b>5</b>      | 0 510 | 1 33859            | 1 3684 | 1 345              | 1 34 | 1 398 0 | 1 6 | 1 351 | 1 34 | 0 4 | 1 0 |
| <b>6</b>      | 0 512 | 2 33859            | 5931   | 0 569              | 0 56 | 398 0   | 2 6 | 2 351 | 34   | 1 4 | 0   |
| <b>7</b>      | 0 515 | 3 33859            | 1 5931 | 1 569              | 1 56 | 3 39820 | 0 0 | 3 351 | 3 34 | 2 4 | 3 0 |
| <b>8</b>      | 0 518 | 0 78741            | 0 8178 | 0 794              | 0 79 | 0 84817 | 1 0 | 0 800 | 0 79 | 3 4 | 0 5 |
| <b>9</b>      | 0 521 | 1 78741            | 0 04 5 | 0 018              | 0 01 | 1 84817 | 2 0 | 1 800 | 1 79 | 0 9 | 1 5 |
| <b>10</b>     | 0 523 | 78741              | 1 0425 | 1 018              | 1 1  | 84817   | 3 0 | 2 800 | 2 79 | 1 9 | 5   |
| <b>11</b>     | 0 526 | 0 3623             | 0 672  | 0 43               | 0 4  | 9813    | 0 5 | 0 249 | 0 4  | 9   | 3 5 |
| <b>12</b>     | 5 9   | 1 23623            | 1 67   | 1 43               | 1 4  | 1 9813  | 1 5 | 1 249 | 1 24 | 0 4 | 0 9 |
| <b>13</b>     | 53    | 36 3               | 0 4919 | 0 467              | 0 46 | 2 29813 | 2 5 | 2 249 | 4    | 1 4 | 1 9 |
| <b>14</b>     | 0 534 | 3 3623             | 1 49 9 | 1 467              | 1 46 | 3 29813 | 3 5 | 3 249 | 3 4  | 2 4 | 2 9 |
| <b>15</b>     | 0 537 | 685 4              | 0 7166 | 0 69               | 0 69 | 0 74810 | 0 9 | 0 699 | 0 69 | 3 4 | 0 4 |
| <b>16</b>     | 0 540 | 1 68504            | 1 7166 | 1 692              | 1 69 | 1 7481  | 1 9 | 1 699 | 1 69 | 0 9 | 1 4 |
| <b>17</b>     | 0 54  | 2 68504            | 0 9413 | 0 916              | 0 91 | 2 74810 | 2 9 | 2 699 | 2 69 | 1 9 | 2 4 |
| <b>18</b>     | 0 545 | 0 13386            | 0 1660 | 141                | 0 14 | 0 19806 | 0 4 | 0 148 | 0 14 | 2 9 | 3 4 |
| <b>19</b>     | 0 548 | 1 13386            | 1 1660 | 1 141              | 1 14 | 1 19806 | 1 4 | 1 148 | 1 14 | 0 4 | 0 8 |
| <b>20</b>     | 0 551 | 13386              | 0 39 7 | 0 365              | 0 36 | 19806   | 2 4 | 2 148 | 14   | 1 4 | 1 8 |
| <b>21</b>     | 0 553 | 3 13386            | 1 39 7 | 1 365              | 1 36 | 3 19806 | 3 4 | 3 148 | 3 14 | 4   | 2 8 |
| <b>22</b>     | 0 556 | 0 58 68            | 0 6154 | 0 59               | 0 58 | 0 64803 | 0 8 | 0 597 | 0 59 | 3 4 | 3   |
| <b>23</b>     | 559   | 1 58268            | 1 6154 | 1 590              | 1 58 | 1 64803 | 1 8 | 1 597 | 1 59 | 0 9 | 1 3 |
| <b>24</b>     | 56    | 58 68              | 0 8401 | 0 814              | 0 81 | 64803   | 8   | 597   | 2 59 | 1 9 | 3   |
| <b>25</b>     | 564   | 0315               | 0 648  | 39                 | 0 3  | 0 9799  | 0 3 | 0 046 | 0 4  | 2 9 | 3 3 |
| <b>26</b>     | 0 567 | 1 03150            | 1 0648 | 1 039              | 1 03 | 1 09799 | 1 3 | 1 46  | 1 4  | 4   | 0 7 |
| <b>27</b>     | 0 570 | 2 3150             | 0 894  | 263                | 6    | 9799    | 3   | 2 046 | 0 4  | 1 4 | 1 7 |
| <b>28</b>     | 0 573 | 3 03150            | 1 894  | 1 263              | 1 6  | 3 09799 | 3 3 | 3 046 | 3 04 | 2 4 | 2 7 |
| <b>29</b>     | 0 575 | 0 48032            | 0 5141 | 0 488              | 0 48 | 0 54796 | 0 8 | 0 495 | 0 48 | 3 4 | 0 1 |

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1              | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           | 12           | 13           | 14           |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day            | Mean Long.   | A            | B            | C            | D            | E            | F            | G-J          | K            | L            | M            | N            | O            |
|                | <sup>c</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>July 30</b> | 150°07471    | 6°52311      | 3'49         | 1'15         | 1'383        | 1'4660       | 1'476        | 211'00       | 0'47         | 1'09         | 1'007        | 1'00         | 3'17         |
| <b>31</b>      | 251'44947    | 0'47219      | 4'49         | 2'15         | 2'383        | 2'4660       | 2'476        | 212'00       | 1'47         | 2'09         | 2'007        | 2'00         | 0'59         |
| <b>Aug. 1</b>  | 352'82424    | 1'47219      | 0'98         | 3'15         | 3'383        | 3'4660       | 3'476        | 213'00       | 0'70         | 3'09         | 3'007        | 3'00         | 1'59         |
| <b>2</b>       | 94'19900     | 2'47219      | 1'98         | 0'60         | 0'830        | 0'9146       | 0'925        | 214'00       | 1'70         | 0'59         | 0'507        | 0'50         | 2'59         |
| <b>3</b>       | 195'57376    | 3'47219      | 2'98         | 1'60         | 1'830        | 1'9146       | 1'925        | 215'00       | 0'93         | 1'59         | 1'507        | 1'50         | 0'01         |
| <b>4</b>       | 296'94852    | 4'47219      | 3'98         | 2'60         | 2'830        | 2'9146       | 2'925        | 216'00       | 0'16         | 2'59         | 2'507        | 2'50         | 1'01         |
| <b>5</b>       | 38'32328     | 5'47219      | 0'47         | 0'04         | 0'277        | 0'3632       | 0'374        | 217'00       | 1'16         | 0'09         | 0'007        | 0'00         | 2'01         |
| <b>6</b>       | 139'69804    | 6'47219      | 1'47         | 1'04         | 1'277        | 1'3632       | 1'374        | 218'00       | 0'39         | 1'09         | 1'007        | 1'00         | 3'01         |
| <b>7</b>       | 241'07281    | 0'42126      | 2'47         | 2'04         | 2'277        | 2'3632       | 2'374        | 219'00       | 1'39         | 2'09         | 2'007        | 2'00         | 0'43         |
| <b>8</b>       | 342'44757    | 1'42126      | 3'47         | 3'04         | 3'277        | 3'3632       | 3'374        | 220'00       | 0'62         | 3'09         | 3'007        | 3'00         | 1'43         |
| <b>9</b>       | 83'82233     | 2'42126      | 4'47         | 0'48         | 0'724        | 0'8118       | 0'823        | 221'00       | 1'62         | 0'59         | 0'508        | 0'50         | 2'43         |
| <b>10</b>      | 185'19709    | 3'42126      | 0'96         | 1'48         | 1'724        | 1'8118       | 1'823        | 222'00       | 0'85         | 1'59         | 1'508        | 1'50         | 3'43         |
| <b>11</b>      | 286'57185    | 4'42126      | 1'96         | 2'48         | 2'724        | 2'8118       | 2'823        | 223'00       | 0'08         | 2'59         | 2'508        | 2'50         | 0'84         |
| <b>12</b>      | 27'94661     | 5'42126      | 2'96         | 3'48         | 0'172        | 0'2603       | 0'271        | 224'00       | 1'08         | 0'10         | 0'008        | 0'00         | 1'84         |
| <b>13</b>      | 129'32138    | 6'42126      | 3'96         | 0'93         | 1'172        | 1'2603       | 1'271        | 225'00       | 0'31         | 1'10         | 1'008        | 1'00         | 2'84         |
| <b>14</b>      | 230'69614    | 0'37033      | 0'45         | 1'93         | 2'172        | 2'2603       | 2'271        | 226'00       | 1'31         | 2'10         | 2'008        | 2'00         | 0'26         |
| <b>15</b>      | 332'07090    | 1'37033      | 1'45         | 2'93         | 3'172        | 3'2603       | 3'271        | 227'00       | 0'54         | 3'10         | 3'008        | 3'00         | 1'26         |
| <b>16</b>      | 73'44566     | 2'37033      | 2'45         | 0'37         | 0'619        | 0'7089       | 0'720        | 228'00       | 1'54         | 0'60         | 0'508        | 0'50         | 2'26         |
| <b>17</b>      | 174'82042    | 3'37033      | 3'45         | 1'37         | 1'619        | 1'7089       | 1'720        | 229'00       | 0'77         | 1'60         | 1'508        | 1'50         | 3'26         |
| <b>18</b>      | 276'19518    | 4'37033      | 4'45         | 2'37         | 2'619        | 2'7089       | 2'720        | 230'00       | 0'00         | 2'60         | 2'508        | 2'50         | 0'68         |
| <b>19</b>      | 17'56995     | 5'37033      | 0'94         | 3'37         | 0'066        | 0'1575       | 0'169        | 231'00       | 1'00         | 0'10         | 0'008        | 0'00         | 1'68         |
| <b>20</b>      | 118'94471    | 6'37033      | 1'94         | 0'81         | 1'066        | 1'1575       | 1'169        | 232'00       | 0'24         | 1'10         | 1'008        | 1'00         | 2'68         |
| <b>21</b>      | 220'31947    | 0'31940      | 2'94         | 1'81         | 2'066        | 2'1575       | 2'169        | 233'00       | 1'24         | 2'10         | 2'008        | 2'00         | 0'09         |
| <b>22</b>      | 321'69423    | 1'31940      | 3'94         | 2'81         | 3'066        | 3'1575       | 3'169        | 234'00       | 0'47         | 3'10         | 3'008        | 3'00         | 1'09         |
| <b>23</b>      | 63'06899     | 2'31940      | 0'42         | 0'26         | 0'513        | 0'6061       | 0'618        | 235'00       | 1'47         | 0'60         | 0'508        | 0'50         | 2'09         |
| <b>24</b>      | 164'44375    | 3'31940      | 1'42         | 1'26         | 1'513        | 1'6061       | 1'618        | 236'00       | 0'70         | 1'60         | 1'508        | 1'50         | 3'09         |
| <b>25</b>      | 265'81852    | 4'31940      | 2'42         | 2'26         | 2'513        | 2'6061       | 2'618        | 237'00       | 1'70         | 2'60         | 2'508        | 2'50         | 0'51         |
| <b>26</b>      | 7'19328      | 5'31940      | 3'42         | 3'26         | 3'513        | 0'0546       | 0'067        | 238'00       | 0'93         | 0'10         | 0'008        | 0'00         | 1'51         |
| <b>27</b>      | 108'56804    | 6'31940      | 4'42         | 0'70         | 0'960        | 1'0546       | 1'067        | 239'00       | 0'16         | 1'10         | 1'008        | 1'00         | 2'51         |
| <b>28</b>      | 209'94280    | 0'26848      | 0'91         | 1'70         | 1'960        | 2'0546       | 2'067        | 240'00       | 1'16         | 2'10         | 2'008        | 2'00         | 3'51         |
| <b>29</b>      | 311'31756    | 1'26848      | 1'91         | 2'70         | 2'960        | 3'0546       | 3'067        | 241'00       | 0'39         | 3'10         | 3'008        | 3'00         | 0'93         |
| <b>30</b>      | 52'69232     | 2'26848      | 2'91         | 0'14         | 0'407        | 0'5032       | 0'515        | 242'00       | 1'39         | 0'60         | 0'508        | 0'50         | 1'93         |
| <b>31</b>      | 154'06709    | 3'26848      | 3'91         | 1'14         | 1'407        | 1'5032       | 1'515        | 243'00       | 0'62         | 1'60         | 1'508        | 1'50         | 2'93         |
| <b>Sept. 1</b> | 255'44185    | 4'26848      | 0'40         | 2'14         | 2'407        | 2'5032       | 2'515        | 244'00       | 1'62         | 2'60         | 2'508        | 2'50         | 0'34         |
| <b>2</b>       | 356'81661    | 5'26848      | 1'40         | 3'14         | 3'407        | 3'5032       | 3'515        | 245'00       | 0'85         | 0'10         | 0'008        | 0'00         | 1'34         |
| <b>3</b>       | 98'19137     | 6'26848      | 2'40         | 0'59         | 0'855        | 0'9518       | 0'964        | 246'00       | 0'08         | 1'10         | 1'008        | 1'00         | 2'34         |
| <b>4</b>       | 199'56613    | 0'21755      | 3'40         | 1'59         | 1'855        | 1'9518       | 1'964        | 247'00       | 1'08         | 2'10         | 2'008        | 2'00         | 3'34         |
| <b>5</b>       | 300'94089    | 1'21755      | 4'40         | 2'59         | 2'855        | 2'9518       | 2'964        | 248'00       | 0'31         | 3'10         | 3'008        | 3'00         | 0'76         |
| <b>6</b>       | 42'31566     | 2'21755      | 0'89         | 0'03         | 0'302        | 0'4004       | 0'413        | 249'00       | 1'31         | 0'61         | 0'508        | 0'50         | 1'76         |
| <b>7</b>       | 143'69042    | 3'21755      | 1'89         | 1'03         | 1'302        | 1'4004       | 1'413        | 250'00       | 0'54         | 1'61         | 1'508        | 1'50         | 2'76         |
| <b>8</b>       | 245'06518    | 4'21755      | 2'89         | 2'03         | 2'302        | 2'4004       | 2'413        | 251'00       | 1'54         | 2'61         | 2'508        | 2'50         | 0'18         |
| <b>9</b>       | 346'43994    | 5'21755      | 3'89         | 3'03         | 3'302        | 3'4004       | 3'413        | 252'00       | 0'77         | 0'11         | 0'009        | 0'00         | 1'18         |
| <b>10</b>      | 87'81470     | 6'21755      | 0'38         | 0'47         | 0'749        | 0'8489       | 0'862        | 253'00       | 0'01         | 1'11         | 1'009        | 1'00         | 2'18         |
| <b>11</b>      | 189'18946    | 0'16662      | 1'38         | 1'47         | 1'749        | 1'8489       | 1'862        | 254'00       | 1'01         | 2'11         | 2'009        | 2'00         | 3'18         |
| <b>12</b>      | 290'56423    | 1'16662      | 2'38         | 2'47         | 2'749        | 2'8489       | 2'862        | 255'00       | 0'24         | 3'11         | 3'009        | 3'00         | 0'59         |
| <b>13</b>      | 31'93899     | 2'16662      | 3'38         | 3'47         | 0'196        | 0'2975       | 0'310        | 256'00       | 1'24         | 0'61         | 0'509        | 0'50         | 1'59         |
| <b>14</b>      | 133'31375    | 3'16662      | 4'38         | 0'92         | 1'196        | 1'2975       | 1'310        | 257'00       | 0'47         | 1'61         | 1'509        | 1'50         | 2'59         |
| <b>15</b>      | 234'68851    | 4'16662      | 0'87         | 1'92         | 2'196        | 2'2975       | 2'310        | 258'00       | 1'47         | 2'61         | 2'509        | 2'50         | 0'01         |
| <b>16</b>      | 336'06327    | 5'16662      | 1'87         | 2'92         | 3'196        | 3'2975       | 3'310        | 259'00       | 0'70         | 0'11         | 0'009        | 0'00         | 1'01         |
| <b>17</b>      | 77'43803     | 6'16662      | 2'87         | 0'36         | 0'643        | 0'7461       | 0'759        | 260'00       | 1'70         | 1'11         | 1'009        | 1'00         | 2'01         |
| <b>18</b>      | 178'81280    | 0'11570      | 3'87         | 1'36         | 1'643        | 1'7461       | 1'759        | 261'00       | 0'93         | 2'11         | 2'009        | 2'00         | 3'01         |
| <b>19</b>      | 280'18756    | 1'11570      | 0'36         | 2'36         | 2'643        | 2'7461       | 2'759        | 262'00       | 0'16         | 3'11         | 3'009        | 3'00         | 0'43         |

In Leap Year diminish the date in Columns 1, 15, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

X continued Motions of Mean Longitude and the Arguments for Days

| 5              | 6     | 7       | 8      | 9     |      |         |     | 3     | 4    | 5   | 6   |
|----------------|-------|---------|--------|-------|------|---------|-----|-------|------|-----|-----|
| Day            | P     | Q       | R      | S     | T    | U       | V   | W     | X    | Y   | Z   |
| <b>July 30</b> | 578   | 1 48 3  | 1 5141 | 1 488 | 1 48 | 1 54796 | 1 8 | 1 495 | 1 48 | 0 9 | 1 1 |
| <b>31</b>      | 0 581 | 4803    | 0 7388 | 0 712 | 0 71 | 54796   | 8   | 495   | 48   | 1 9 | 1   |
| <b>Aug 1</b>   | 584   | 3 48032 | 1 7388 | 1 71  | 1 71 | 3 54796 | 0   | 3 495 | 3 48 | 9   | 3 1 |
| <b>2</b>       | 586   | 0 92914 | 0 9635 | 0 937 | 0 93 | 0 9979  | 1   | 944   | 0 93 | 0 4 | 0 6 |
| <b>3</b>       | 0 589 | 1 92914 | 0 188  | 0 161 | 16   | 1 99792 | 2 2 | 1 944 | 1 93 | 1 4 | 1 6 |
| <b>4</b>       | 0 59  | 9 914   | 1 1882 | 1 161 | 1 16 | 2 99792 | 3 2 | 2 944 | 93   | 4   | 2 6 |
| <b>5</b>       | 0 595 | 37796   | 0 4129 | 0 385 | 0 38 | 44789   | 0 7 | 0 393 | 0 38 | 3 4 | 0   |
| <b>6</b>       | 0 597 | 1 37796 | 1 41 9 | 1 385 | 1 38 | 1 44789 | 1 7 | 1 393 | 1 38 | 0 9 | 1 0 |
| <b>7</b>       | 0 600 | 2 37796 | 0 6376 | 0 610 | 0 60 | 2 44789 | 2 7 | 2 393 | 2 38 | 1 9 | 2 0 |
| <b>8</b>       | 603   | 3 37796 | 1 6376 | 1 610 | 1 60 | 3 44789 | 0 1 | 3 393 | 3 38 | 9   | 3 0 |
| <b>9</b>       | 0 605 | 0 8 678 | 0 86 3 | 0 834 | 0 83 | 0 89785 | 1 1 | 0 84  | 0 83 | 0 4 | 0 5 |
| <b>10</b>      | 0 608 | 1 8 678 | 0 087  | 0 059 | 0 05 | 1 89785 | 1   | 1 84  | 1 83 | 1 4 | 1 5 |
| <b>11</b>      | 0 611 | 2 8 678 | 1 0870 | 1 059 | 1 05 | 2 89785 | 3 1 | 842   | 2 83 | 2 4 | 5   |
| <b>12</b>      | 0 614 | 0 7560  | 0 3117 | 0 83  | 0 28 | 3478    | 0 6 | 91    | 0 28 | 3 4 | 3 5 |
| <b>13</b>      | 0 616 | 1 7560  | 1 3117 | 1 283 | 1 28 | 1 3478  | 1 6 | 1 91  | 1 28 | 0 9 | 9   |
| <b>14</b>      | 619   | 2 2756  | 0 5364 | 508   | 0 50 | 2 34782 | 2 6 | 2 291 | 2 8  | 1 9 | 1 9 |
| <b>15</b>      | 0 6 2 | 3 7560  | 1 5364 | 1 508 | 1 50 | 3 3478  | 0 0 | 3 91  | 3 28 | 9   | 2 9 |
| <b>16</b>      | 0 6 5 | 0 72442 | 0 7611 | 0 73  | 0 73 | 0 79779 | 1 0 | 0 740 | 0 73 | 0 4 | 0 4 |
| <b>17</b>      | 0 6 7 | 1 7244  | 1 7611 | 1 73  | 1 73 | 1 79779 | 2 0 | 1 740 | 1 73 | 1 4 | 1 4 |
| <b>18</b>      | 0 630 | 72442   | 0 9858 | 0 957 | 0 95 | 2 79779 | 3 0 | 740   | 2 73 | 2 4 | 2 4 |
| <b>19</b>      | 0 633 | 0 17323 | 0 21 5 | 0 181 | 0 18 | 0 24775 | 0 5 | 189   | 0 18 | 3 4 | 3 4 |
| <b>20</b>      | 636   | 1 173 3 | 1 2105 | 1 181 | 1 18 | 1 24775 | 1 5 | 1 189 | 1 18 | 0 9 | 0 8 |
| <b>21</b>      | 0 638 | 2 17323 | 0 435  | 0 4 6 | 0 40 | 2 4775  | 2 5 | 2 189 | 2 18 | 1 9 | 1 8 |
| <b>22</b>      | 641   | 3 173 3 | 1 435  | 1 406 | 1 40 | 3 4775  | 3 5 | 3 189 | 3 18 | 2 9 | 2 8 |
| <b>23</b>      | 0 644 | 0 62205 | 0 6599 | 630   | 0 62 | 0 6977  | 0 9 | 638   | 0 63 | 0 4 | 2   |
| <b>24</b>      | 647   | 1 6 05  | 1 6599 | 1 63  | 1 6  | 1 6977  | 1 9 | 1 638 | 1 63 | 1 4 | 1   |
| <b>25</b>      | 0 649 | 2 6 205 | 8846   | 0 855 | 0 85 | 6977    | 9   | 638   | 63   | 4   | 2   |
| <b>26</b>      | 652   | 0 07087 | 0 1093 | 0 079 | 0 07 | 14768   | 0 4 | 87    | 0 07 | 3 4 | 3   |
| <b>27</b>      | 0 655 | 1 07087 | 1 1093 | 1 079 | 1 07 | 1 14768 | 1 4 | 1 087 | 1 07 | 0 9 | 7   |
| <b>28</b>      | 0 658 | 2 07087 | 0 3340 | 0 304 | 30   | 2 14768 | 2 4 | 2 087 | 7    | 9   | 1 7 |
| <b>29</b>      | 0 660 | 3 7087  | 1 3340 | 1 3 4 | 1 30 | 3 14768 | 3 4 | 3 087 | 3 07 | 9   | 7   |
| <b>30</b>      | 663   | 0 51969 | 5587   | 0 5 8 | 0 52 | 0 59765 | 8   | 536   | 0 5  | 4   | 0 1 |
| <b>31</b>      | 0 666 | 1 51969 | 1 5587 | 1 5 8 | 1 5  | 1 59765 | 1 8 | 1 536 | 1 52 | 1 4 | 1 1 |
| <b>Sept 1</b>  | 0 668 | 2 51969 | 0 7834 | 0 753 | 75   | 2 59765 | 8   | 2 536 | 2 52 | 2 4 | 1   |
| <b>2</b>       | 0 671 | 3 51969 | 0 081  | 1 753 | 1 75 | 0 04761 | 0 3 | 3 536 | 3 5  | 3 4 | 3 1 |
| <b>3</b>       | 674   | 0 96851 | 1 081  | 0 977 | 0 97 | 1 4761  | 1 3 | 0 985 | 0 97 | 9   | 0 6 |
| <b>4</b>       | 677   | 1 96851 | 0 2328 | 0 201 | 2    | 2 4761  | 3   | 1 985 | 1 97 | 1 9 | 1 6 |
| <b>5</b>       | 0 679 | 96851   | 1 3 8  | 1 1   | 1 20 | 3 04761 | 3 3 | 985   | 97   | 9   | 2 6 |
| <b>6</b>       | 0 68  | 0 41733 | 4575   | 0 426 | 0 4  | 0 49758 | 0 7 | 0 435 | 4    | 0 4 | 0 0 |
| <b>7</b>       | 0 685 | 1 41733 | 1 4575 | 1 426 | 1 42 | 1 49758 | 1 7 | 1 435 | 1 4  | 1 4 | 1 0 |
| <b>8</b>       | 688   | 2 41733 | 0 68   | 650   | 0 64 | 49758   | 7   | 435   | 42   | 4   | 0   |
| <b>9</b>       | 0 69  | 3 41733 | 1 68   | 1 650 | 1 64 | 3 49758 | 0   | 3 435 | 3 4  | 3 4 | 3 0 |
| <b>10</b>      | 0 693 | 0 86615 | 0 9 69 | 875   | 0 87 | 0 94754 | 1   | 0 884 | 0 87 | 0 9 | 0 5 |
| <b>11</b>      | 0 696 | 1 86615 | 0 1315 | 0 099 | 0 9  | 1 94754 | 2 2 | 1 884 | 1 87 | 1 9 | 1 5 |
| <b>12</b>      | 699   | 2 86615 | 1 1315 | 1 099 | 1 09 | 2 94754 | 3   | 884   | 2 87 | 2 9 | 2 5 |
| <b>13</b>      | 0 701 | 0 31497 | 0 3562 | 0 3 4 | 3    | 0 39751 | 0 7 | 0 333 | 0 3  | 0 4 | 3 5 |
| <b>14</b>      | 0 704 | 1 31497 | 1 3562 | 1 3 4 | 1 32 | 1 39751 | 1 7 | 1 333 | 1 32 | 1 4 | 0 9 |
| <b>15</b>      | 707   | 2 31497 | 5809   | 0 548 | 0 54 | 39751   | 2 7 | 333   | 2 3  | 4   | 1 9 |
| <b>16</b>      | 0 710 | 3 31497 | 1 5809 | 1 548 | 1 54 | 3 39751 | 0 1 | 3 333 | 3 32 | 3 4 | 2 9 |
| <b>17</b>      | 0 712 | 0 76379 | 0 8056 | 0 773 | 0 77 | 0 84747 | 1 1 | 782   | 0 77 | 0 9 | 0 3 |
| <b>18</b>      | 0 715 | 1 76379 | 0 303  | 1 773 | 1 77 | 1 84747 | 1   | 1 78  | 1 77 | 1 9 | 1 3 |
| <b>19</b>      | 0 718 | 2 76379 | 1 0303 | 997   | 0 99 | 84747   | 3 1 | 2 78  | 77   | 2 9 | 2 3 |



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

**X continued** Motions of Mean Longitude and the Arguments for Days

| 1               | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9      | 10   | 11   | 12    | 13   | 14   |
|-----------------|------------|---------|------|------|-------|--------|-------|--------|------|------|-------|------|------|
| Day             | Mean Long. | A       | B    | C    | D     | E      | F     | G-J    | K    | L    | M     | N    | O    |
|                 | °          | d       | d    | d    | d     | d      | d     | d      | d    | d    | d     | d    | d    |
| <b>Sept. 20</b> | 21°56232   | 2°11570 | 1°36 | 3°36 | 0°091 | 0°1947 | 0°208 | 263°00 | 1°16 | 0°61 | 0°509 | 0°50 | 1°43 |
| <b>21</b>       | 122°93708  | 3°11570 | 2°36 | 0°80 | 1°091 | 1°1947 | 1°208 | 264°00 | 0°39 | 1°61 | 1°509 | 1°50 | 2°43 |
| <b>22</b>       | 224°31184  | 4°11570 | 3°36 | 1°80 | 2°091 | 2°1947 | 2°208 | 265°00 | 1°39 | 2°61 | 2°509 | 2°50 | 3°43 |
| <b>23</b>       | 325°68660  | 5°11570 | 4°36 | 2°80 | 3°091 | 3°1947 | 3°208 | 266°00 | 0°62 | 0°11 | 0°009 | 0°00 | 0°84 |
| <b>24</b>       | 67°06137   | 6°11570 | 0°85 | 0°25 | 0°538 | 0°6433 | 0°657 | 267°00 | 1°62 | 1°11 | 1°009 | 1°00 | 1°84 |
| <b>25</b>       | 168°43613  | 0°06477 | 1°85 | 1°25 | 1°538 | 1°6433 | 1°657 | 268°00 | 0°85 | 2°11 | 2°009 | 2°00 | 2°84 |
| <b>26</b>       | 269°81089  | 1°06477 | 2°85 | 2°25 | 2°538 | 2°6433 | 2°657 | 269°00 | 0°08 | 3°11 | 3°009 | 3°00 | 0°26 |
| <b>27</b>       | 11°18565   | 2°06477 | 3°85 | 3°25 | 3°538 | 0°0918 | 0°105 | 270°00 | 1°08 | 0°61 | 0°509 | 0°50 | 1°26 |
| <b>28</b>       | 112°56041  | 3°06477 | 0°34 | 0°69 | 0°985 | 1°0918 | 1°105 | 271°00 | 0°31 | 1°61 | 1°509 | 1°50 | 2°26 |
| <b>29</b>       | 213°93517  | 4°06477 | 1°34 | 1°69 | 1°985 | 2°0918 | 2°105 | 272°00 | 1°31 | 2°61 | 2°509 | 2°50 | 3°26 |
| <b>30</b>       | 315°30994  | 5°06477 | 2°34 | 2°69 | 2°985 | 3°0918 | 3°105 | 273°00 | 0°54 | 0°12 | 0°009 | 0°00 | 0°68 |
| <b>Oct. 1</b>   | 56°68470   | 6°06477 | 3°34 | 0°13 | 0°432 | 0°5404 | 0°554 | 274°00 | 1°54 | 1°12 | 1°009 | 1°00 | 1°68 |
| <b>2</b>        | 158°05946  | 0°01384 | 4°34 | 1°13 | 1°432 | 1°5404 | 1°554 | 275°00 | 0°77 | 2°12 | 2°009 | 2°00 | 2°68 |
| <b>3</b>        | 259°43422  | 1°01384 | 0°82 | 2°13 | 2°432 | 2°5404 | 2°554 | 276°00 | 0°01 | 3°12 | 3°009 | 3°00 | 0°09 |
| <b>4</b>        | 0°80898    | 2°01384 | 1°82 | 3°13 | 3°432 | 3°5404 | 0°003 | 277°00 | 1°01 | 0°62 | 0°509 | 0°50 | 1°09 |
| <b>5</b>        | 102°18374  | 3°01384 | 2°82 | 0°58 | 0°879 | 0°9890 | 1°003 | 278°00 | 0°24 | 1°62 | 1°509 | 1°50 | 2°09 |
| <b>6</b>        | 203°55851  | 4°01384 | 3°82 | 1°58 | 1°879 | 1°9890 | 2°003 | 279°00 | 1°24 | 2°62 | 2°509 | 2°50 | 3°09 |
| <b>7</b>        | 304°93327  | 5°01384 | 0°31 | 2°58 | 2°879 | 2°9890 | 3°003 | 280°00 | 0°47 | 0°12 | 0°010 | 0°00 | 0°51 |
| <b>8</b>        | 46°30803   | 6°01384 | 1°31 | 0°02 | 0°326 | 0°4376 | 0°452 | 281°00 | 1°47 | 1°12 | 1°010 | 1°00 | 1°51 |
| <b>9</b>        | 147°68279  | 7°01384 | 2°31 | 1°02 | 1°326 | 1°4376 | 1°452 | 282°00 | 0°70 | 2°12 | 2°010 | 2°00 | 2°51 |
| <b>10</b>       | 249°05755  | 0°96291 | 3°31 | 2°02 | 2°326 | 2°4376 | 2°452 | 283°00 | 1°70 | 3°12 | 3°010 | 3°00 | 3°51 |
| <b>11</b>       | 350°43231  | 1°96291 | 4°31 | 3°02 | 3°326 | 3°4376 | 3°452 | 284°00 | 0°93 | 0°62 | 0°510 | 0°50 | 0°93 |
| <b>12</b>       | 91°80708   | 2°96291 | 0°80 | 0°46 | 0°774 | 0°8861 | 0°900 | 285°00 | 0°16 | 1°62 | 1°510 | 1°50 | 1°93 |
| <b>13</b>       | 193°18184  | 3°96291 | 1°80 | 1°46 | 1°774 | 1°8861 | 1°900 | 286°00 | 1°16 | 2°62 | 2°510 | 2°50 | 2°93 |
| <b>14</b>       | 294°55660  | 4°96291 | 2°80 | 2°46 | 2°774 | 2°8861 | 2°900 | 287°00 | 0°39 | 0°12 | 0°010 | 0°00 | 0°34 |
| <b>15</b>       | 35°93136   | 5°96291 | 3°80 | 3°46 | 0°221 | 0°3347 | 0°349 | 288°00 | 1°39 | 1°12 | 1°010 | 1°00 | 1°34 |
| <b>16</b>       | 137°30612  | 6°96291 | 0°29 | 0°91 | 1°221 | 1°3347 | 1°349 | 289°00 | 0°62 | 2°12 | 2°010 | 2°00 | 2°34 |
| <b>17</b>       | 238°68088  | 0°91199 | 1°29 | 1°91 | 2°221 | 2°3347 | 2°349 | 290°00 | 1°62 | 3°12 | 3°010 | 3°00 | 3°34 |
| <b>18</b>       | 340°05565  | 1°91199 | 2°29 | 2°91 | 3°221 | 3°3347 | 3°349 | 291°00 | 0°85 | 0°62 | 0°510 | 0°50 | 0°76 |
| <b>19</b>       | 81°43041   | 2°91199 | 3°29 | 0°35 | 0°668 | 0°7833 | 0°798 | 292°00 | 0°08 | 1°62 | 1°510 | 1°50 | 1°76 |
| <b>20</b>       | 182°80517  | 3°91199 | 4°29 | 1°35 | 1°668 | 1°7833 | 1°798 | 293°00 | 1°08 | 2°62 | 2°510 | 2°50 | 2°76 |
| <b>21</b>       | 284°17993  | 4°91199 | 0°78 | 2°35 | 2°668 | 2°7833 | 2°798 | 294°00 | 0°31 | 0°12 | 0°010 | 0°00 | 0°18 |
| <b>22</b>       | 25°55469   | 5°91199 | 1°78 | 3°35 | 0°115 | 0°2319 | 0°247 | 295°00 | 1°31 | 1°12 | 1°010 | 1°00 | 1°18 |
| <b>23</b>       | 126°92945  | 6°91199 | 2°78 | 0°79 | 1°115 | 1°2319 | 1°247 | 296°00 | 0°54 | 2°12 | 2°010 | 2°00 | 2°18 |
| <b>24</b>       | 228°30422  | 0°86106 | 3°78 | 1°79 | 2°115 | 2°2319 | 2°247 | 297°00 | 1°54 | 3°12 | 3°010 | 3°00 | 3°18 |
| <b>25</b>       | 329°67898  | 1°86106 | 0°27 | 2°79 | 3°115 | 3°2319 | 3°247 | 298°00 | 0°78 | 0°63 | 0°510 | 0°50 | 0°59 |
| <b>26</b>       | 71°05374   | 2°86106 | 1°27 | 0°24 | 0°562 | 0°6804 | 0°695 | 299°00 | 0°01 | 1°63 | 1°510 | 1°50 | 1°59 |
| <b>27</b>       | 172°42850  | 3°86106 | 2°27 | 1°24 | 1°562 | 1°6804 | 1°695 | 300°00 | 1°01 | 2°63 | 2°510 | 2°50 | 2°59 |
| <b>28</b>       | 273°80326  | 4°86106 | 3°27 | 2°24 | 2°562 | 2°6804 | 2°695 | 301°00 | 0°24 | 0°13 | 0°010 | 0°00 | 0°01 |
| <b>29</b>       | 15°17802   | 5°86106 | 4°27 | 3°24 | 0°009 | 0°1290 | 0°144 | 302°00 | 1°24 | 1°13 | 1°010 | 1°00 | 1°01 |
| <b>30</b>       | 116°55279  | 6°86106 | 0°76 | 0°68 | 1°009 | 1°1290 | 1°144 | 303°00 | 0°47 | 2°13 | 2°010 | 2°00 | 2°01 |
| <b>Nov. 1</b>   | 217°92755  | 0°81013 | 1°76 | 1°68 | 2°009 | 2°1290 | 2°144 | 304°00 | 1°47 | 3°13 | 3°010 | 3°00 | 3°01 |
| <b>2</b>        | 319°30231  | 1°81013 | 2°76 | 2°68 | 3°009 | 3°1290 | 3°144 | 305°00 | 0°70 | 0°63 | 0°510 | 0°50 | 0°43 |
| <b>3</b>        | 60°67707   | 2°81013 | 3°76 | 0°12 | 0°457 | 0°5776 | 0°593 | 306°00 | 1°70 | 1°63 | 1°510 | 1°50 | 1°43 |
| <b>4</b>        | 162°05183  | 3°81013 | 0°25 | 1°12 | 1°457 | 1°5776 | 1°593 | 307°00 | 0°93 | 2°63 | 2°510 | 2°50 | 2°43 |
| <b>5</b>        | 263°42659  | 4°81013 | 1°25 | 2°12 | 2°457 | 2°5776 | 2°593 | 308°00 | 0°16 | 0°13 | 0°011 | 0°00 | 3°43 |
| <b>6</b>        | 4°80136    | 5°81013 | 2°25 | 3°12 | 3°457 | 0°0262 | 0°042 | 309°00 | 1°16 | 1°13 | 1°011 | 1°00 | 0°85 |
| <b>7</b>        | 106°17612  | 6°81013 | 3°25 | 0°57 | 0°904 | 1°0262 | 1°042 | 310°00 | 0°39 | 2°13 | 2°011 | 2°00 | 1°85 |
| <b>8</b>        | 207°55088  | 0°75921 | 4°25 | 1°57 | 1°904 | 2°0262 | 2°042 | 311°00 | 1°39 | 3°13 | 3°011 | 3°00 | 2°85 |
| <b>9</b>        | 308°92564  | 1°75921 | 0°74 | 2°57 | 2°904 | 3°0262 | 3°042 | 312°00 | 0°62 | 0°63 | 0°511 | 0°50 | 0°26 |
| <b>10</b>       | 50°30040   | 2°75921 | 1°74 | 0°01 | 0°351 | 0°4748 | 0°490 | 313°00 | 1°62 | 1°63 | 1°511 | 1°50 | 1°26 |
|                 | 151°67517  | 3°75921 | 2°74 | 1°01 | 1°351 | 1°4748 | 1°490 | 314°00 | 0°85 | 2°63 | 2°511 | 2°50 | 2°26 |

In Leap Year diminish the date in Columns 1, 15, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 5              | 6        | 7           | 8      | 9     |      |             |          | 3         | 4         | 5        | 6        |
|----------------|----------|-------------|--------|-------|------|-------------|----------|-----------|-----------|----------|----------|
| Day            | P        | Q           | R      | S     | T    | U           | V        | W         | X         | Y        | Z        |
| <b>Sept 20</b> | y<br>721 | d<br>0 1 61 | 0 2550 | 0 2   | 0 1  | d<br>0 9744 | d<br>0 6 | d<br>0 31 | d<br>0 22 | d<br>0 4 | d<br>3 3 |
| <b>21</b>      | 0 723    | 1 1 61      | 1 2550 | 1     | 1 1  | 1 9744      | 1 6      | 1 31      | 1         | 1 4      | 0 8      |
| <b>22</b>      | 0 7 6    | 2 21 61     | 0 4797 | 0 446 | 0 44 | 2 9744      | 6        | 31        |           | 2 4      | 1 8      |
| <b>23</b>      | 0 729    | 3 1 61      | 1 4797 | 1 446 | 1 44 | 3 29744     | 0 0      | 3 31      | 3         | 3 4      | 2 8      |
| <b>24</b>      | 0 73     | 0 6614      | 0 7 44 | 671   | 0 66 | 0 74740     | 1 0      | 0 680     | 67        | 0 9      | 2        |
| <b>25</b>      | 734      | 1 6614      | 1 7044 | 1 671 | 1 66 | 1 74740     |          | 1 680     | 1 67      | 1 9      | 1        |
| <b>26</b>      | 0 737    | 6614        | 0 9 91 | 0 895 | 0 89 | 74740       | 3 0      | 680       | 67        | 2 9      |          |
| <b>27</b>      | 0 74     | 11 4        | 0 1538 | 1 0   | 0 11 | 0 19737     | 5        | 1 9       | 0 11      | 0 4      | 3        |
| <b>28</b>      | 0 74     | 1 11024     | 1 538  | 1 12  | 1 11 | 1 19737     | 1 5      | 1 129     | 1 11      | 1 4      | 7        |
| <b>29</b>      | 0 745    | 11 4        | 0 3785 | 0 344 | 0 34 | 2 19737     | 2 5      | 2 129     | 11        | 2 4      | 1 7      |
| <b>Oct 30</b>  | 748      | 3 110 4     | 3785   | 1 344 | 1 34 | 3 19737     | 3 5      | 3 1 9     | 3 11      | 3 4      | 2 7      |
| <b>1</b>       | 751      | 0 55906     | 0 603  | 0 569 | 0 56 | 0 64734     | 0 9      | 578       | 0 56      | 0 9      | 0 1      |
| <b>2</b>       | 753      | 559 6       | 1 603  | 1 569 | 1 56 | 1 64734     | 1 9      | 1 578     | 1 56      | 1 9      | 1 1      |
| <b>3</b>       | 0 756    | 2 559 6     | 0 8 79 | 0 793 | 79   | 2 64734     | 9        | 578       | 56        | 9        | 1        |
| <b>4</b>       | 0 59     | 0 0 788     | 0 5 6  | 0 17  | 0 01 | 9730        | 0 4      | 0 0 7     | 0 1       | 0 4      | 3 1      |
| <b>5</b>       | 0 762    | 1 788       | 1 05 6 | 1 017 | 1 01 | 1 09730     | 1 4      | 1 0 7     | 1 01      | 1 4      | 0 6      |
| <b>6</b>       | 764      | 0 788       | 0 2773 | 0 24  | 0 23 | 09730       | 4        | 027       | 2 01      | 4        | 1 6      |
| <b>7</b>       | 0 767    | 3 00788     | 1 773  | 1 24  | 1 23 | 3 9730      | 3 4      | 3 027     | 3 01      | 3 4      | 2 6      |
| <b>8</b>       | 0 770    | 0 45670     | 0 50 0 | 0 466 | 0 46 | 0 54727     | 8        | 0 476     | 0 46      | 0 9      | 0 0      |
| <b>9</b>       | 0 773    | 1 45670     | 5020   | 1 466 | 1 46 | 1 547 7     | 1 8      | 1 476     | 1 46      | 1 9      | 1 0      |
| <b>10</b>      | 0 775    | 2 45670     | 0 7 67 | 0 691 | 0 68 | 2 547 7     | 2 8      | 476       | 46        | 9        | 2 0      |
| <b>11</b>      | 778      | 3 45670     | 1 7 67 | 1 691 | 1 68 | 3 54727     | 0 3      | 3 476     | 3 46      | 0 4      | 3 0      |
| <b>12</b>      | 0 781    | 0 9055      | 0 9514 | 915   | 0 91 | 0 99723     | 1 3      | 0 9 5     | 0 91      | 1 4      | 0 4      |
| <b>13</b>      | 0 784    | 1 9055      | 0 1761 | 0 140 | 0 13 | 1 99723     | 3        | 1 9 5     | 1 91      | 2 4      | 1 4      |
| <b>14</b>      | 0 786    | 9 552       | 1 1761 | 1 140 | 1 13 | 997 3       | 3 3      | 2 9 5     | 91        | 3 4      | 4        |
| <b>15</b>      | 0 789    | 0 35434     | 4 08   | 0 364 | 0 36 | 0 44720     | 0 7      | 0 374     | 0 36      | 0 9      | 3 4      |
| <b>16</b>      | 0 79     | 1 35434     | 1 4 8  | 1 364 | 1 36 | 1 44720     | 1 7      | 1 374     | 1 36      | 1 9      | 0 9      |
| <b>17</b>      | 795      | 35434       | 0 6 55 | 0 589 | 58   | 447 0       | 2 7      | 374       | 2 36      | 2 9      | 1 9      |
| <b>18</b>      | 0 797    | 3 35434     | 1 6 55 | 1 589 | 1 58 | 3 447 0     |          | 3 374     | 3 36      | 0 4      | 2 9      |
| <b>19</b>      | 0 800    | 0 80316     | 0 8502 | 0 813 | 0 81 | 0 89716     | 1        | 0 823     | 0 81      | 1 4      | 0 3      |
| <b>20</b>      | 0 803    | 1 8 316     | 0 0749 | 0 38  | 0 3  | 1 89716     | 2        | 1 8 3     | 1 81      | 2 4      | 1 3      |
| <b>21</b>      | 0 805    | 80316       | 1 0749 | 1 38  | 1 03 | 89716       | 3 2      | 8 3       | 2 81      | 3 4      | 3        |
| <b>22</b>      | 0 808    | 0 5198      | 0 996  | 0 6   | 0 5  | 34713       | 0 6      | 0 27      | 0 6       | 0 9      | 3 3      |
| <b>23</b>      | 0 811    | 1 5198      | 1 2996 | 1 62  | 1 5  | 1 34713     | 1 6      | 1 72      | 1 26      | 1 9      | 0 8      |
| <b>24</b>      | 0 814    | 5198        | 0 5243 | 0 487 | 0 48 | 2 34713     | 2 6      | 2 7       | 2 6       | 2 9      | 1 8      |
| <b>25</b>      | 0 816    | 3 5198      | 1 5 43 | 1 487 | 1 48 | 3 34713     | 0 1      | 3 272     | 3 26      | 0 4      | 2 8      |
| <b>26</b>      | 0 819    | 0 7 80      | 0 7489 | 0 711 | 0 70 | 0 797 9     | 1 1      | 0 7 1     | 0 71      | 1 4      | 0        |
| <b>27</b>      | 0 8      | 1 7 08      | 1 7489 | 1 711 | 1 70 | 1 79709     | 2 1      | 1 721     | 1 71      | 4        | 1 2      |
| <b>28</b>      | 8 5      | 70080       | 0 9736 | 0 936 | 0 93 | 79709       | 3 1      | 2 7 1     | 2 71      | 3 4      | 2 2      |
| <b>29</b>      | 0 8 7    | 14961       | 0 1983 | 0 160 | 0 15 | 0 247 6     | 0 5      | 0 170     | 0 15      | 0 9      | 3 2      |
| <b>30</b>      | 0 830    | 1 14961     | 1 1983 | 1 16  | 1 15 | 1 4706      | 1 5      | 1 170     | 1 15      | 1 9      | 0 7      |
| <b>31</b>      | 0 833    | 14961       | 0 4 30 | 0 385 | 0 38 | 2 4706      | 2 5      | 2 17      | 2 15      | 9        | 1 7      |
| <b>Nov 1</b>   | 0 836    | 3 14961     | 1 4 3  | 1 385 | 1 38 | 3 4706      | 0 0      | 3 170     | 3 15      | 0 4      | 2 7      |
| <b>2</b>       | 0 838    | 59843       | 0 6477 | 0 609 | 0 60 | 0 69702     | 1 0      | 620       | 0 60      | 1 4      | 1        |
| <b>3</b>       | 0 841    | 1 59843     | 1 6477 | 1 609 | 1 60 | 1 69702     | 2 0      | 1 620     | 1 60      | 4        | 1 1      |
| <b>4</b>       | 0 844    | 2 59843     | 0 8724 | 833   | 0 83 | 6970        | 3 0      | 2 6 0     | 2 60      | 3 4      | 2 1      |
| <b>5</b>       | 0 847    | 0 4725      | 0 971  | 0 58  | 0 05 | 0 14699     | 0 5      | 0 069     | 5         | 0 9      | 3 1      |
| <b>6</b>       | 0 849    | 1 047 5     | 1 0971 | 1 058 | 1 05 | 1 14699     | 1 5      | 1 69      | 1 05      | 1 9      | 0 5      |
| <b>7</b>       | 0 85     | 0 47 5      | 0 3 18 | 0 8   | 0 27 | 14699       | 2 5      | 2 069     | 0 5       | 9        | 1 5      |
| <b>8</b>       | 0 855    | 3 04725     | 1 3 18 | 1 28  | 1 7  | 3 14699     | 3 5      | 3 069     | 3 05      | 0 4      | 5        |
| <b>9</b>       | 0 858    | 0 49607     | 0 5465 | 0 507 | 0 50 | 0 59696     | 0 9      | 0 518     | 0 50      | 1 4      | 0 0      |
| <b>10</b>      | 0 860    | 1 49607     | 1 5465 | 1 507 | 1 50 | 1 59696     | 1 9      | 1 518     | 1 50      | 2 4      | 1 0      |

I L p Y dimi i h d t e i C l m by d y f t F b 8



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1              | 2          | 3       | 4    | 5    | 6     | 7      | 8     | 9      | 10   | 11   | 12    | 13   | 14   |
|----------------|------------|---------|------|------|-------|--------|-------|--------|------|------|-------|------|------|
| Day            | Mean Long. | A       | B    | C    | D     | E      | F     | G-J    | K    | L    | M     | N    | O    |
|                | °          | d       | d    | d    | d     | d      | d     | d      | d    | d    | d     | d    | d    |
| <b>Nov. 11</b> | 253°04993  | 4°75921 | 3°74 | 2°01 | 2°351 | 2°4748 | 2°490 | 315°00 | 0°08 | 0°13 | 0°011 | 0°00 | 3°26 |
| <b>12</b>      | 354°42469  | 5°75921 | 0°22 | 3°01 | 3°351 | 3°4748 | 3°490 | 316°00 | 1°08 | 1°13 | 1°011 | 1°00 | 0°68 |
| <b>13</b>      | 95°79945   | 6°75921 | 1°22 | 0°45 | 0°798 | 0°9233 | 0°939 | 317°00 | 0°31 | 2°13 | 2°011 | 2°00 | 1°68 |
| <b>14</b>      | 197°17421  | 0°70828 | 2°22 | 1°45 | 1°798 | 1°9233 | 1°939 | 318°00 | 1°31 | 3°13 | 3°011 | 3°00 | 2°68 |
| <b>15</b>      | 298°54897  | 1°70828 | 3°22 | 2°45 | 2°798 | 2°9233 | 2°939 | 319°00 | 0°54 | 0°64 | 0°511 | 0°50 | 0°10 |
| <b>16</b>      | 39°92374   | 2°70828 | 4°22 | 3°45 | 0°245 | 0°3719 | 0°388 | 320°00 | 1°54 | 1°64 | 1°511 | 1°50 | 1°10 |
| <b>17</b>      | 141°29850  | 3°70828 | 0°71 | 0°90 | 1°245 | 1°3719 | 1°388 | 321°00 | 0°78 | 2°64 | 2°511 | 2°50 | 2°10 |
| <b>18</b>      | 242°67326  | 4°70828 | 1°71 | 1°90 | 2°245 | 2°3719 | 2°388 | 322°00 | 0°01 | 0°14 | 0°011 | 0°00 | 3°10 |
| <b>19</b>      | 344°04802  | 5°70828 | 2°71 | 2°90 | 3°245 | 3°3719 | 3°388 | 323°00 | 1°01 | 1°14 | 1°011 | 1°00 | 0°51 |
| <b>20</b>      | 85°42278   | 6°70828 | 3°71 | 0°34 | 0°692 | 0°8205 | 0°837 | 324°00 | 0°24 | 2°14 | 2°011 | 2°00 | 1°51 |
| <b>21</b>      | 186°79754  | 0°65735 | 0°20 | 1°34 | 1°692 | 1°8205 | 1°837 | 325°00 | 1°24 | 3°14 | 3°011 | 3°00 | 2°51 |
| <b>22</b>      | 288°17231  | 1°65735 | 1°20 | 2°34 | 2°692 | 2°8205 | 2°837 | 326°00 | 0°47 | 0°64 | 0°511 | 0°50 | 3°51 |
| <b>23</b>      | 29°54707   | 2°65735 | 2°20 | 3°34 | 0°140 | 0°2691 | 0°285 | 327°00 | 1°47 | 1°64 | 1°511 | 1°50 | 0°93 |
| <b>24</b>      | 130°92183  | 3°65735 | 3°20 | 0°78 | 1°140 | 1°2691 | 1°285 | 328°00 | 0°70 | 2°64 | 2°511 | 2°50 | 1°93 |
| <b>25</b>      | 232°29659  | 4°65735 | 4°20 | 1°78 | 2°140 | 2°2691 | 2°285 | 329°00 | 1°70 | 0°14 | 0°011 | 0°00 | 2°93 |
| <b>26</b>      | 333°67135  | 5°65735 | 0°69 | 2°78 | 3°140 | 3°2691 | 3°285 | 330°00 | 0°93 | 1°14 | 1°011 | 1°00 | 0°35 |
| <b>27</b>      | 75°04611   | 6°65735 | 1°69 | 0°22 | 0°587 | 0°7176 | 0°734 | 331°00 | 0°16 | 2°14 | 2°011 | 2°00 | 1°35 |
| <b>28</b>      | 176°42088  | 0°60642 | 2°69 | 1°22 | 1°587 | 1°7176 | 1°734 | 332°00 | 1°16 | 3°14 | 3°011 | 3°00 | 2°35 |
| <b>29</b>      | 277°79564  | 1°60642 | 3°69 | 2°22 | 2°587 | 2°7176 | 2°734 | 333°00 | 0°39 | 0°64 | 0°511 | 0°49 | 3°35 |
| <b>30</b>      | 19°17040   | 2°60642 | 0°18 | 3°22 | 0°034 | 0°1662 | 0°183 | 334°00 | 1°39 | 1°64 | 1°511 | 1°49 | 0°76 |
| <b>Dec. 1</b>  | 120°54516  | 3°60642 | 1°18 | 0°67 | 1°034 | 1°1662 | 1°183 | 335°00 | 0°62 | 2°64 | 2°511 | 2°49 | 1°76 |
| <b>2</b>       | 221°91992  | 4°60642 | 2°18 | 1°67 | 2°034 | 2°1662 | 2°183 | 336°00 | 1°62 | 0°14 | 0°011 | 3°49 | 2°76 |
| <b>3</b>       | 323°29468  | 5°60642 | 3°18 | 2°67 | 3°034 | 3°1662 | 3°183 | 337°00 | 0°85 | 1°14 | 1°011 | 0°99 | 0°18 |
| <b>4</b>       | 64°66945   | 6°60642 | 4°18 | 0°11 | 0°481 | 0°6148 | 0°632 | 338°00 | 0°08 | 2°14 | 2°011 | 1°99 | 1°18 |
| <b>5</b>       | 166°04421  | 0°55550 | 0°67 | 1°11 | 1°481 | 1°6148 | 1°632 | 339°00 | 1°08 | 3°14 | 3°011 | 2°99 | 2°18 |
| <b>6</b>       | 267°41897  | 1°55550 | 1°67 | 2°11 | 2°481 | 2°6148 | 2°632 | 340°00 | 0°31 | 0°64 | 0°512 | 0°49 | 3°18 |
| <b>7</b>       | 8°79373    | 2°55550 | 2°67 | 3°11 | 3°481 | 0°0634 | 0°080 | 341°00 | 1°31 | 1°64 | 1°512 | 1°49 | 0°60 |
| <b>8</b>       | 110°16849  | 3°55550 | 3°67 | 0°55 | 0°928 | 1°0634 | 1°080 | 342°00 | 0°55 | 2°64 | 2°512 | 2°49 | 1°60 |
| <b>9</b>       | 211°54325  | 4°55550 | 0°16 | 1°55 | 1°928 | 2°0634 | 2°080 | 343°00 | 1°55 | 0°15 | 0°012 | 3°49 | 2°60 |
| <b>10</b>      | 312°91802  | 5°55550 | 1°16 | 2°55 | 2°928 | 3°0634 | 3°080 | 344°00 | 0°78 | 1°15 | 1°012 | 0°99 | 0°01 |
| <b>11</b>      | 54°29278   | 6°55550 | 2°16 | 0°00 | 0°375 | 0°5119 | 0°529 | 345°00 | 0°01 | 2°15 | 2°012 | 1°99 | 1°01 |
| <b>12</b>      | 155°66754  | 0°50457 | 3°16 | 1°00 | 1°375 | 1°5119 | 1°529 | 346°00 | 1°01 | 3°15 | 3°012 | 2°99 | 2°01 |
| <b>13</b>      | 257°04230  | 1°50457 | 4°16 | 2°00 | 2°375 | 2°5119 | 2°529 | 347°00 | 0°24 | 0°65 | 0°512 | 0°49 | 3°01 |
| <b>14</b>      | 358°41706  | 2°50457 | 0°65 | 3°00 | 3°375 | 3°5119 | 3°529 | 348°00 | 1°24 | 1°65 | 1°512 | 1°49 | 0°43 |
| <b>15</b>      | 99°79182   | 3°50457 | 1°65 | 0°44 | 0°823 | 0°9605 | 0°978 | 349°00 | 0°47 | 2°65 | 2°512 | 2°49 | 1°43 |
| <b>16</b>      | 201°16659  | 4°50457 | 2°65 | 1°44 | 1°823 | 1°9605 | 1°978 | 350°00 | 1°47 | 0°15 | 0°012 | 3°49 | 2°43 |
| <b>17</b>      | 302°54135  | 5°50457 | 3°65 | 2°44 | 2°823 | 2°9605 | 2°978 | 351°00 | 0°70 | 1°15 | 1°012 | 0°99 | 3°43 |
| <b>18</b>      | 43°91611   | 6°50457 | 0°14 | 3°44 | 0°270 | 0°4091 | 0°427 | 352°00 | 1°70 | 2°15 | 2°012 | 1°99 | 0°85 |
| <b>19</b>      | 145°29087  | 0°45364 | 1°14 | 0°88 | 1°270 | 1°4091 | 1°427 | 353°00 | 0°93 | 3°15 | 3°012 | 2°99 | 1°85 |
| <b>20</b>      | 246°66563  | 1°45364 | 2°14 | 1°88 | 2°270 | 2°4091 | 2°427 | 354°00 | 0°16 | 0°65 | 0°512 | 0°49 | 2°85 |
| <b>21</b>      | 348°04039  | 2°45364 | 3°14 | 2°88 | 3°270 | 3°4091 | 3°427 | 355°00 | 1°16 | 1°65 | 1°512 | 1°49 | 0°26 |
| <b>22</b>      | 89°41516   | 3°45364 | 4°14 | 0°33 | 0°717 | 0°8577 | 0°875 | 356°00 | 0°39 | 2°65 | 2°512 | 2°49 | 1°26 |
| <b>23</b>      | 190°78992  | 4°45364 | 0°63 | 1°33 | 1°717 | 1°8577 | 1°875 | 357°00 | 1°39 | 0°15 | 0°012 | 3°49 | 2°26 |
| <b>24</b>      | 292°16468  | 5°45364 | 1°63 | 2°33 | 2°717 | 2°8577 | 2°875 | 358°00 | 0°62 | 1°15 | 1°012 | 0°99 | 3°26 |
| <b>25</b>      | 33°53944   | 6°45364 | 2°63 | 3°33 | 0°164 | 0°3063 | 0°324 | 359°00 | 1°62 | 2°15 | 2°012 | 1°99 | 0°68 |
| <b>26</b>      | 134°91420  | 0°40272 | 3°63 | 0°77 | 1°164 | 1°3063 | 1°324 | 360°00 | 0°85 | 3°15 | 3°012 | 2°99 | 1°68 |
| <b>27</b>      | 236°28896  | 1°40272 | 0°11 | 1°77 | 2°164 | 2°3063 | 2°324 | 361°00 | 0°08 | 0°65 | 0°512 | 0°49 | 2°68 |
| <b>28</b>      | 337°66373  | 2°40272 | 1°11 | 2°77 | 3°164 | 3°3063 | 3°324 | 362°00 | 1°08 | 1°65 | 1°512 | 1°49 | 0°10 |
| <b>29</b>      | 79°03849   | 3°40272 | 2°11 | 0°21 | 0°611 | 0°7548 | 0°773 | 363°00 | 0°31 | 2°65 | 2°512 | 2°49 | 1°10 |
| <b>30</b>      | 180°41325  | 4°40272 | 3°11 | 1°21 | 1°611 | 1°7548 | 1°773 | 364°00 | 1°31 | 0°15 | 0°012 | 3°49 | 2°10 |
| <b>31</b>      | 281°78801  | 5°40272 | 4°11 | 2°21 | 2°611 | 2°7548 | 2°773 | 365°00 | 0°55 | 1°15 | 1°012 | 0°99 | 3°10 |
| <b>32</b>      | 23°16277   | 6°40272 | 0°60 | 3°21 | 0°058 | 0°2034 | 0°222 | 366°00 | 1°55 | 2°15 | 2°012 | 1°99 | 0°51 |

In Leap Year diminish the date in Columns 1, 15, by 1 day after Feb. 28.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 5          | 6     | 7       | 8      | 9     |      |         |     | 3     | 4    | 5   | 6   |
|------------|-------|---------|--------|-------|------|---------|-----|-------|------|-----|-----|
| Day        | P     | Q       | R      | S     | T    | U       | V   | W     | X    | Y   | Z   |
| <b>Nov</b> |       |         | l      | d     |      |         | l   |       |      |     | d   |
| 11         | 863   | 49607   | 0 771  | 0 731 | 72   | 59696   | 9   | 2 518 | 2 50 | 3 4 | 2   |
| 12         | 0 866 | 3 49607 | 1 7712 | 1 731 | 1 72 | 0 0469  | 0 4 | 3 518 | 3 50 | 0 9 | 3 0 |
| 13         | 0 868 | 0 94489 | 0 9959 | 0 956 | 0 95 | 1 0469  | 1 4 | 967   | 0 95 | 1 9 | 0 4 |
| 14         | 0 871 | 1 94489 | 0 2206 | 0 180 | 0 17 | 0 469   | 2 4 | 1 967 | 1 95 | 2 9 | 1 4 |
| 15         | 0 874 | 2 94489 | 1 2 6  | 1 180 | 1 17 | 3 0469  | 3 4 | 967   | 95   | 0 4 | 2 4 |
| 16         | 877   | 0 39371 | 0 4453 | 0 405 | 0 40 | 0 49689 | 0 8 | 0 416 | 0 40 | 1 4 | 3 4 |
| 17         | 0 879 | 1 39371 | 1 4453 | 1 4 5 | 1 4  | 1 49689 | 1 8 | 1 416 | 1 40 | 2 4 | 0 9 |
| 18         | 88    | 2 39371 | 6700   | 0 6 9 | 0 6  | 49689   | 8   | 2 416 | 40   | 3 4 | 1 9 |
| 19         | 0 885 | 3 39371 | 1 6700 | 1 629 | 1 6  | 3 49689 | 0 3 | 3 416 | 3 40 | 0 9 | 2 9 |
| 20         | 888   | 0 84253 | 0 8947 | 0 854 | 0 85 | 0 94685 | 1 3 | 0 865 | 0 85 | 1 9 | 0 3 |
| 21         | 890   | 1 84 53 | 0 1194 | 0 078 | 0 07 | 1 94685 | 3   | 1 865 | 1 85 | 2 9 | 1 3 |
| 22         | 0 893 | 2 84 53 | 1 1194 | 1 078 | 1 07 | 94685   | 3 3 | 2 865 | 2 85 | 0 4 | 2 3 |
| 23         | 0 896 | 0 9135  | 0 3441 | 0 303 | 0 9  | 0 3968  | 0 7 | 0 314 | 0 30 | 1 4 | 3 3 |
| 24         | 0 899 | 1 29135 | 1 3441 | 1 303 | 1 9  | 1 3968  | 1 7 | 1 314 | 1 30 | 2 4 | 0 8 |
| 25         | 9 1   | 9135    | 0 5688 | 0 527 | 0 52 | 39682   | 2 7 | 314   | 2 30 | 3 4 | 1 8 |
| 26         | 0 904 | 3 9135  | 1 5688 | 1 527 | 1 5  | 3 3968  | 0   | 3 314 | 3 30 | 0 9 | 2 8 |
| 27         | 0 907 | 74017   | 0 7935 | 0 75  | 0 74 | 0 84678 | 1   | 0 763 | 0 75 | 1 9 | 0 2 |
| 28         | 0 910 | 1 74017 | 0 018  | 1 752 | 1 74 | 1 84678 | 2 2 | 1 763 | 1 75 | 2 9 | 1 2 |
| 29         | 0 912 | 74017   | 1 0182 | 0 976 | 0 97 | 2 84678 | 3 2 | 763   | 2 75 | 0 4 | 2 2 |
| 30         | 0 915 | 0 18899 | 0 2429 | 0 201 | 0 19 | 0 29675 | 0 6 | 0 21  | 0 19 | 1 4 | 3 2 |
| <b>Dec</b> |       |         |        |       |      |         |     |       |      |     |     |
| 1          | 918   | 1 18899 | 1 429  | 1 01  | 1 19 | 1 9675  | 1 6 | 1 212 | 1 19 | 2 4 | 0 6 |
| 2          | 0 921 | 2 18899 | 0 4676 | 0 425 | 0 42 | 2 9675  | 2 6 | 2 212 | 2 19 | 3 4 | 1 6 |
| 3          | 0 923 | 3 18899 | 1 4676 | 1 4 5 | 1 42 | 3 9675  | 0 1 | 3 21  | 3 19 | 0 9 | 2 6 |
| 4          | 0 926 | 0 63780 | 0 69 3 | 0 649 | 0 64 | 0 74671 | 1 1 | 0 661 | 0 64 | 1 9 | 0 1 |
| 5          | 0 9 9 | 1 63780 | 1 69 3 | 1 649 | 1 64 | 1 74671 | 2 1 | 1 661 | 1 64 | 2 9 | 1 1 |
| 6          | 0 93  | 63780   | 0 9170 | 0 874 | 0 87 | 2 74671 | 3 1 | 2 661 | 2 64 | 0 4 | 2 1 |
| 7          | 0 934 | 0 08662 | 0 1417 | 0 098 | 9    | 0 19668 | 0 5 | 0 110 | 0 09 | 1 4 | 3 1 |
| 8          | 0 937 | 1 0866  | 1 1417 | 1 098 | 1 09 | 1 19668 | 1 5 | 1 110 | 1 09 | 2 4 | 0 5 |
| 9          | 0 940 | 0 8662  | 0 3664 | 0 323 | 0 31 | 1 9668  | 2 5 | 2 110 | 0 9  | 3 4 | 1 5 |
| 10         | 0 942 | 3 0866  | 1 3664 | 1 3 3 | 1 31 | 3 19668 | 0 0 | 3 110 | 3 09 | 9   | 2 5 |
| 11         | 0 945 | 53544   | 0 5910 | 0 547 | 0 54 | 0 64664 | 1 0 | 0 559 | 0 54 | 1 9 | 0 0 |
| 12         | 0 948 | 1 53544 | 1 5910 | 1 547 | 1 54 | 1 64664 | 0   | 1 559 | 1 54 | 2 9 | 1 0 |
| 13         | 0 951 | 53544   | 8157   | 0 77  | 0 76 | 2 64664 | 3 0 | 2 559 | 54   | 0 4 | 2 0 |
| 14         | 0 953 | 3 53544 | 0 0404 | 1 772 | 1 76 | 0 09661 | 0 4 | 0 008 | 3 54 | 1 4 | 3 0 |
| 15         | 0 956 | 0 98426 | 1 0404 | 0 996 | 0 99 | 1 09661 | 1 4 | 1 008 | 0 99 | 2 4 | 0 4 |
| 16         | 0 959 | 1 98426 | 0 651  | 0 221 | 0 21 | 2 09661 | 2 4 | 2 008 | 1 99 | 3 4 | 1 4 |
| 17         | 0 962 | 2 98426 | 1 2651 | 1 221 | 1 21 | 3 09661 | 3 4 | 3 008 | 2 99 | 0 9 | 2 4 |
| 18         | 0 964 | 0 43308 | 0 4898 | 0 445 | 0 44 | 0 54657 | 0 9 | 0 457 | 0 44 | 1 9 | 3 4 |
| 19         | 0 967 | 1 43308 | 1 4898 | 1 445 | 1 44 | 1 54657 | 1 9 | 1 457 | 1 44 | 2 9 | 0 9 |
| 20         | 0 970 | 2 43308 | 0 7145 | 0 670 | 0 66 | 2 54657 | 2 9 | 2 457 | 2 44 | 0 4 | 1 9 |
| 21         | 0 973 | 3 43308 | 1 7145 | 1 670 | 1 66 | 3 54657 | 0 4 | 3 457 | 3 44 | 1 4 | 2 9 |
| 22         | 975   | 0 88190 | 0 939  | 894   | 88   | 0 99654 | 1 4 | 0 906 | 0 89 | 2 4 | 0 3 |
| 23         | 0 978 | 1 88190 | 0 1639 | 0 119 | 0 11 | 1 99654 | 2 4 | 1 906 | 1 89 | 3 4 | 1 3 |
| 24         | 0 981 | 2 88190 | 1 1639 | 1 119 | 1 11 | 2 99654 | 3 4 | 906   | 89   | 0 9 | 2 3 |
| 25         | 0 984 | 0 3307  | 0 3886 | 0 343 | 0 33 | 0 44650 | 0 8 | 0 356 | 0 34 | 1 9 | 3 3 |
| 26         | 0 986 | 1 33072 | 1 3886 | 1 343 | 1 33 | 1 4465  | 1 8 | 1 356 | 1 34 | 2 9 | 0 7 |
| 27         | 0 989 | 2 3307  | 0 6133 | 0 568 | 0 56 | 44650   | 2 8 | 2 356 | 2 34 | 0 4 | 1 7 |
| 28         | 0 992 | 3 33 72 | 1 6133 | 1 568 | 1 56 | 3 44650 | 0 3 | 3 356 | 3 34 | 1 4 | 2 7 |
| 29         | 0 995 | 0 77954 | 0 8380 | 0 792 | 0 78 | 89646   | 1 3 | 8 5   | 0 79 | 2 4 | 0 2 |
| 30         | 0 997 | 1 77954 | 0 0627 | 0 017 | 0 01 | 1 89646 | 2 3 | 1 8 5 | 1 79 | 3 4 | 1 2 |
| 31         | 1 000 | 2 77954 | 1 0627 | 1 017 | 1 01 | 89646   | 3 3 | 805   | 2 79 | 0 9 | 2   |
| 32         | 1 0 3 | 0 2 836 | 0 2874 | 0 241 | 0 23 | 34643   | 0 7 | 0 254 | 0 23 | 1 9 | 3 2 |

I L pY dimi l hth dat i C l m by d y fte F b 8

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

**XI**

**Motion of Mean Longitude for Parts of a Day**

| 1    | 2          | 1    | 2          |
|------|------------|------|------------|
| Days | Mean Long. | Days | Mean Long. |
| d    | o          | d    | o          |
| 0.01 | 1.01375    | 0.51 | 51.70113   |
| 0.02 | 2.02750    | 0.52 | 52.71488   |
| 0.03 | 3.04124    | 0.53 | 53.72862   |
| 0.04 | 4.05499    | 0.54 | 54.74237   |
| 0.05 | 5.06874    | 0.55 | 55.75612   |
| 0.06 | 6.08249    | 0.56 | 56.76987   |
| 0.07 | 7.09623    | 0.57 | 57.78361   |
| 0.08 | 8.10998    | 0.58 | 58.79736   |
| 0.09 | 9.12373    | 0.59 | 59.81111   |
| 0.10 | 10.13748   | 0.60 | 60.82486   |
| 0.11 | 11.15122   | 0.61 | 61.83860   |
| 0.12 | 12.16497   | 0.62 | 62.85235   |
| 0.13 | 13.17872   | 0.63 | 63.86610   |
| 0.14 | 14.19247   | 0.64 | 64.87985   |
| 0.15 | 15.20621   | 0.65 | 65.89360   |
| 0.16 | 16.21996   | 0.66 | 66.90734   |
| 0.17 | 17.23371   | 0.67 | 67.92109   |
| 0.18 | 18.24746   | 0.68 | 68.93484   |
| 0.19 | 19.26120   | 0.69 | 69.94859   |
| 0.20 | 20.27495   | 0.70 | 70.96233   |
| 0.21 | 21.28870   | 0.71 | 71.97608   |
| 0.22 | 22.30245   | 0.72 | 72.98983   |
| 0.23 | 23.31620   | 0.73 | 74.00358   |
| 0.24 | 24.32994   | 0.74 | 75.01732   |
| 0.25 | 25.34369   | 0.75 | 76.03107   |
| 0.26 | 26.35744   | 0.76 | 77.04482   |
| 0.27 | 27.37119   | 0.77 | 78.05857   |
| 0.28 | 28.38493   | 0.78 | 79.07231   |
| 0.29 | 29.39868   | 0.79 | 80.08606   |
| 0.30 | 30.41243   | 0.80 | 81.09981   |
| 0.31 | 31.42618   | 0.81 | 82.11356   |
| 0.32 | 32.43992   | 0.82 | 83.12730   |
| 0.33 | 33.45367   | 0.83 | 84.14105   |
| 0.34 | 34.46742   | 0.84 | 85.15480   |
| 0.35 | 35.48117   | 0.85 | 86.16855   |
| 0.36 | 36.49491   | 0.86 | 87.18230   |
| 0.37 | 37.50866   | 0.87 | 88.19604   |
| 0.38 | 38.52241   | 0.88 | 89.20979   |
| 0.39 | 39.53616   | 0.89 | 90.22354   |
| 0.40 | 40.54990   | 0.90 | 91.23729   |
| 0.41 | 41.56365   | 0.91 | 92.25103   |
| 0.42 | 42.57740   | 0.92 | 93.26478   |
| 0.43 | 43.59115   | 0.93 | 94.27853   |
| 0.44 | 44.60490   | 0.94 | 95.29228   |
| 0.45 | 45.61864   | 0.95 | 96.30602   |
| 0.46 | 46.63239   | 0.96 | 97.31977   |
| 0.47 | 47.64614   | 0.97 | 98.33352   |
| 0.48 | 48.65989   | 0.98 | 99.34727   |
| 0.49 | 49.67363   | 0.99 | 100.36101  |
| 0.50 | 50.68738   | 1.00 | 101.37476  |

| 3      | 4          | 3      | 4          |
|--------|------------|--------|------------|
| Days   | Mean Long. | Days   | Mean Long. |
| d      | o          | d      | o          |
| 0.0001 | 0.01014    | 0.0051 | 0.51701    |
| 0.0002 | 0.02027    | 0.0052 | 0.52715    |
| 0.0003 | 0.03041    | 0.0053 | 0.53729    |
| 0.0004 | 0.04055    | 0.0054 | 0.54742    |
| 0.0005 | 0.05069    | 0.0055 | 0.55756    |
| 0.0006 | 0.06083    | 0.0056 | 0.56770    |
| 0.0007 | 0.07096    | 0.0057 | 0.57784    |
| 0.0008 | 0.08110    | 0.0058 | 0.58797    |
| 0.0009 | 0.09124    | 0.0059 | 0.59811    |
| 0.0010 | 0.10137    | 0.0060 | 0.60825    |
| 0.0011 | 0.11151    | 0.0061 | 0.61839    |
| 0.0012 | 0.12165    | 0.0062 | 0.62852    |
| 0.0013 | 0.13179    | 0.0063 | 0.63866    |
| 0.0014 | 0.14192    | 0.0064 | 0.64880    |
| 0.0015 | 0.15206    | 0.0065 | 0.65894    |
| 0.0016 | 0.16220    | 0.0066 | 0.66907    |
| 0.0017 | 0.17234    | 0.0067 | 0.67921    |
| 0.0018 | 0.18247    | 0.0068 | 0.68935    |
| 0.0019 | 0.19261    | 0.0069 | 0.69949    |
| 0.0020 | 0.20275    | 0.0070 | 0.70962    |
| 0.0021 | 0.21289    | 0.0071 | 0.71976    |
| 0.0022 | 0.22302    | 0.0072 | 0.72990    |
| 0.0023 | 0.23316    | 0.0073 | 0.74004    |
| 0.0024 | 0.24330    | 0.0074 | 0.75017    |
| 0.0025 | 0.25344    | 0.0075 | 0.76031    |
| 0.0026 | 0.26357    | 0.0076 | 0.77045    |
| 0.0027 | 0.27371    | 0.0077 | 0.78059    |
| 0.0028 | 0.28385    | 0.0078 | 0.79072    |
| 0.0029 | 0.29399    | 0.0079 | 0.80086    |
| 0.0030 | 0.30412    | 0.0080 | 0.81100    |
| 0.0031 | 0.31426    | 0.0081 | 0.82114    |
| 0.0032 | 0.32440    | 0.0082 | 0.83127    |
| 0.0033 | 0.33454    | 0.0083 | 0.84141    |
| 0.0034 | 0.34467    | 0.0084 | 0.85155    |
| 0.0035 | 0.35481    | 0.0085 | 0.86169    |
| 0.0036 | 0.36495    | 0.0086 | 0.87182    |
| 0.0037 | 0.37509    | 0.0087 | 0.88196    |
| 0.0038 | 0.38522    | 0.0088 | 0.89210    |
| 0.0039 | 0.39536    | 0.0089 | 0.90224    |
| 0.0040 | 0.40550    | 0.0090 | 0.91237    |
| 0.0041 | 0.41564    | 0.0091 | 0.92251    |
| 0.0042 | 0.42577    | 0.0092 | 0.93265    |
| 0.0043 | 0.43591    | 0.0093 | 0.94279    |
| 0.0044 | 0.44605    | 0.0094 | 0.95292    |
| 0.0045 | 0.45619    | 0.0095 | 0.96306    |
| 0.0046 | 0.46632    | 0.0096 | 0.97320    |
| 0.0047 | 0.47646    | 0.0097 | 0.98334    |
| 0.0048 | 0.48660    | 0.0098 | 0.99347    |
| 0.0049 | 0.49674    | 0.0099 | 1.00361    |
| 0.0050 | 0.50687    | 0.0100 | 1.01375    |

For the Arguments A—Z (omitting P), the fraction of a day must be added to the sum of the entries taken from Tables IX, X.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XII

Equation of Longitude

Argument A

| A                    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | A                    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | A    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | A    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ |
|----------------------|----------|----------|-----------------------|----------------------|----------|----------|-----------------------|------|----------|----------|-----------------------|------|----------|----------|-----------------------|
| <sup>d</sup><br>0 00 | 1 7500   | +1934    | 0                     | <sup>d</sup><br>0 50 | 1 91 74  | +1185    | -13                   | 1 00 | 1 1128   | -434     | -16                   | 1 50 | 1 53916  | -170     | -8                    |
| 01                   | 1 9434   | 1934     | -1                    | 51                   | 1 9 446  | 1158     | 15                    | 01   | 2 10678  | 467      | 18                    | 51   | 1 5 08   | 1715     | 7                     |
| 02                   | 1 11367  | 1932     | 1                     | 52                   | 1 93589  | 11 8     | 16                    | 02   | 2 10194  | 500      | 16                    | 52   | 1 50486  | 17 9     | 7                     |
| 03                   | 1 13 98  | 193      | 1                     | 53                   | 1 94701  | 1099     | 13                    | 03   | 09678    | 53       | 16                    | 53   | 1 48751  | 1742     | 7                     |
| 04                   | 1 15 8   | 1929     | 1                     | 54                   | 1 95787  | 107      | 15                    | 04   | 2 913    | 565      | 17                    | 54   | 1 47 0   | 1756     | 7                     |
| 05                   | 1 17156  | 19 6     |                       | 55                   | 1 96844  | 1043     | 15                    | 05   | 08549    | 597      | 16                    | 55   | 1 45 40  | 1768     | 6                     |
| 0 06                 | 1 19 8   | +19 3    | -                     | 0 56                 | 1 9787   | +1014    | -15                   | 1 06 | 2 07937  | -6 9     | -16                   | 1 56 | 1 43467  | -1778    | -5                    |
| 07                   | 1 1001   | 1918     | 3                     | 57                   | 1 98871  | 984      | 16                    | 07   | 2 07293  | 66       | 16                    | 57   | 1 41684  | 1789     | 6                     |
| 08                   | 1 915    | 191      | 3                     | 58                   | 1 99839  | 953      | 15                    | 08   | 06618    | 691      | 16                    | 58   | 1 39889  | 1800     | 5                     |
| 09                   | 1 48 4   | 1907     |                       | 59                   | 00777    | 92       | 16                    | 09   | 05911    | 7 4      | 16                    | 59   | 1 38084  | 1810     | 5                     |
| 10                   | 1 673    | 19       | 4                     | 60                   | 01683    | 892      | 15                    | 10   | 2 05173  | 754      | 16                    | 60   | 1 36269  | 1820     | 5                     |
| 0 11                 | 1 8628   | +1895    | -4                    | 0 61                 | 0 560    | +861     | -16                   | 1 11 | 04404    | -784     | -15                   | 1 61 | 1 34445  | 18 9     | -5                    |
| 12                   | 1 30519  | 1887     | 4                     | 62                   | 2 3405   | 830      | 15                    | 12   | 03605    | 814      | 15                    | 62   | 1 3 612  | 1837     | 4                     |
| 13                   | 1 3 4    | 1879     | 4                     | 63                   | 2 04220  | 799      | 16                    | 13   | 2 02776  | 845      | 16                    | 63   | 1 30771  | 1844     | 3                     |
| 14                   | 1 34277  | 1871     | 5                     | 64                   | 5 3      | 768      | 16                    | 14   | 01916    | 875      | 15                    | 64   | 1 8924   | 1851     | 4                     |
| 15                   | 1 36143  | 1861     | 5                     | 65                   | 05755    | 737      | 16                    | 15   | 010 6    | 905      | 15                    | 65   | 1 27 69  | 1858     | 3                     |
| 0 16                 | 1 37999  | +1851    | -5                    | 0 66                 | 2 06476  | +705     | -17                   | 1 16 | 2 0106   | -934     | -14                   | 1 66 | 1 5208   | -1864    | -3                    |
| 17                   | 1 39845  | 1841     | 6                     | 67                   | 07164    | 672      | 17                    | 17   | 1 99158  | 96       | 14                    | 67   | 1 3342   | 1869     | 3                     |
| 18                   | 1 41680  | 183      | 6                     | 68                   | 2 07819  | 639      | 16                    | 18   | 1 9818   | 991      | 15                    | 68   | 1 21470  | 1874     | 2                     |
| 19                   | 1 43504  | 1819     | 6                     | 69                   | 08442    | 607      | 17                    | 19   | 1 97177  | 10 0     | 15                    | 69   | 1 19594  | 1878     | 2                     |
| 20                   | 1 45316  | 18 5     | 8                     | 70                   | 2 9032   | 574      | 17                    | 20   | 1 96142  | 1049     | 14                    | 70   | 1 17714  | 1882     | 2                     |
| 0 21                 | 1 47113  | +1791    | -6                    | 0 71                 | 2 09589  | +541     | -17                   | 1 21 | 1 95079  | -1076    | -13                   | 1 71 | 1 15831  | -1885    | -2                    |
| 22                   | 1 48898  | 1779     | 6                     | 72                   | 2 10113  | 508      | 16                    | 22   | 1 93991  | 110      | 14                    | 72   | 1 13945  | 1887     | 1                     |
| 23                   | 1 50671  | 1766     | 8                     | 73                   | 10605    | 476      | 17                    | 23   | 1 9 875  | 1130     | 14                    | 73   | 1 1 057  | 1889     | -1                    |
| 24                   | 1 5 4 9  | 175      | 8                     | 74                   | 2 11064  | 442      | 18                    | 24   | 1 91731  | 1157     | 13                    | 74   | 1 10167  | 1890     | 0                     |
| 25                   | 1 54171  | 1734     | 9                     | 75                   | 2 11188  | 408      | 16                    | 25   | 1 9056   | 1183     | 14                    | 75   | 1 08 77  | 1891     | -1                    |
| 0 26                 | 1 55896  | +1719    | -7                    | 0 76                 | 1188     | +375     | -18                   | 1 26 | 1 89366  | -1209    | -13                   | 1 76 | 1 06386  | -1891    | 0                     |
| 27                   | 1 57607  | 1702     | 9                     | 77                   | 2 12 37  | 340      | 17                    | 27   | 1 88144  | 1235     | 13                    | 77   | 1 04495  | 1891     | +1                    |
| 28                   | 1 59300  | 1684     | 9                     | 78                   | 2 1 560  | 307      | 16                    | 28   | 1 86897  | 1259     | 1                     | 78   | 1 0 605  | 1890     | 1                     |
| 29                   | 1 60976  | 1668     | 9                     | 79                   | 1 851    | 274      | 17                    | 29   | 1 856 7  | 1284     | 14                    | 79   | 1 00716  | 1888     | 2                     |
| 30                   | 1 62635  | 1650     | 10                    | 80                   | 13108    | 240      | 17                    | 30   | 1 84329  | 1310     | 1                     | 80   | 0 98830  | 1885     | 1                     |
| 0 31                 | 1 64 75  | +1631    | 9                     | 0 81                 | 13331    | +6       | 17                    | 1 31 | 1 83007  | -1333    | -11                   | 1 81 | 0 96946  | -1883    | +2                    |
| 32                   | 1 65897  | 161      | 11                    | 82                   | 2 135 0  | 172      | 17                    | 32   | 1 81663  | 1356     | 12                    | 82   | 0 95065  | 1879     |                       |
| 33                   | 1 67498  | 1592     | 10                    | 83                   | 13675    | 138      | 18                    | 33   | 1 80 95  | 1379     | 11                    | 83   | 0 93188  | 1875     |                       |
| 34                   | 1 69 80  | 1571     | 11                    | 84                   | 13795    | 103      | 17                    | 34   | 1 789 5  | 140      | 1                     | 84   | 91315    | 1870     | 3                     |
| 35                   | 1 7 640  | 1551     | 10                    | 85                   | 13881    | 70       | 16                    | 35   | 1 7749   | 1425     | 1                     | 85   | 0 89448  | 1865     | 3                     |
| 0 36                 | 1 7218   | +1530    | -1                    | 0 86                 | 2 13935  | +36      | -18                   | 1 36 | 1 76056  | -1447    | -11                   | 1 86 | 0 87586  | -1860    | +3                    |
| 37                   | 1 73699  | 1508     | 11                    | 87                   | 2 13953  | +2       | 16                    | 37   | 1 74599  | 1468     | 11                    | 87   | 0 857 9  | 1854     | 4                     |
| 38                   | 1 75196  | 1487     | 11                    | 88                   | 13939    | -3       | 18                    | 38   | 1 73120  | 1489     | 10                    | 88   | 0 83879  | 1846     | 4                     |
| 39                   | 1 7667   | 1463     | 13                    | 89                   | 13889    | 66       | 16                    | 39   | 1 7162   | 1508     | 10                    | 89   | 0 8 037  | 1838     | 4                     |
| 40                   | 1 781    | 1439     | 11                    | 90                   | 138 7    | 99       | 17                    | 40   | 1 7 104  | 1528     | 1                     | 90   | 0 80203  | 1831     | 4                     |
| 0 41                 | 1 7955   | +1416    | -12                   | 0 91                 | 13691    | -134     | -18                   | 1 41 | 1 68566  | -1549    | -11                   | 1 91 | 0 78376  | -1822    | +6                    |
| 42                   | 1 8 954  | 139      | 13                    | 92                   | 2 13540  | 168      | 17                    | 42   | 1 67007  | 1568     | 9                     | 92   | 0 7656   | 181      | 4                     |
| 43                   | 1 8 333  | 1367     | 1                     | 93                   | 13355    | 0        | 17                    | 43   | 1 65431  | 1585     | 9                     | 93   | 0 74752  | 1803     | 6                     |
| 44                   | 1 83688  | 1343     | 13                    | 94                   | 13137    | 236      | 18                    | 44   | 1 63837  | 1604     | 10                    | 94   | 0 72955  | 1792     | 5                     |
| 45                   | 1 85018  | 1317     | 14                    | 95                   | 12884    | 269      | 16                    | 45   | 1 6 224  | 1621     | 8                     | 95   | 71168    | 1782     | 6                     |
| 0 46                 | 1 86321  | +1 91    | -1                    | 0 96                 | 2 12599  | -30      | -17                   | 1 46 | 1 60595  | -1638    | -9                    | 1 96 | 0 6939   | -1770    | +7                    |
| 47                   | 1 8760   | 1266     | 14                    | 97                   | 1 81     | 335      | 17                    | 47   | 1 58949  | 1654     | 8                     | 97   | 0 67629  | 1758     | 5                     |
| 48                   | 1 8885   | 1 38     | 14                    | 98                   | 2 11929  | 368      | 16                    | 48   | 1 57287  | 1671     | 9                     | 98   | 0 65876  | 1746     | 7                     |
| 49                   | 1 90 76  | 1 11     | 13                    | 99                   | 2 11546  | 401      | 18                    | 49   | 1 55608  | 1686     | 7                     | 99   | 0 64137  | 1732     | 7                     |
| 0 50                 | 1 91 74  | +1185    | -13                   | 1 00                 | 111 8    | -434     | -16                   | 1 50 | 1 53916  | -1700    | -8                    | 2 00 | 0 6241   | -1718    | +7                    |

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Equation of Longitude

Argument A

| 1         | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     |
|-----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|
| A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| d<br>2'00 | 0'62412       | -1718    | +7                    | d<br>2'50 | 0'03512       | -481     | +16                   | d<br>3'00 | 0'20732       | +1130    | +13                   | d<br>3'50 | 1'02600       | +1923    | +1                    |
| 01        | 0'60701       | 1705     | 7                     | 51        | 0'03047       | 449      | 17                    | 01        | 0'21875       | 1158     | 15                    | 51        | 1'04523       | 1924     | +1                    |
| 02        | 0'59003       | 1690     | 9                     | 52        | 0'02615       | 416      | 17                    | 02        | 0'23048       | 1186     | 13                    | 52        | 1'06448       | 1925     | 0                     |
| 03        | 0'57322       | 1674     | 7                     | 53        | 0'02216       | 382      | 17                    | 03        | 0'24247       | 1213     | 14                    | 53        | 1'08373       | 1925     | 0                     |
| 04        | 0'55655       | 1659     | 9                     | 54        | 0'01851       | 350      | 16                    | 04        | 0'25473       | 1239     | 13                    | 54        | 1'10298       | 1924     | -1                    |
| 05        | 0'54005       | 1642     | 8                     | 55        | 0'01517       | 318      | 17                    | 05        | 0'26725       | 1266     | 14                    | 55        | 1'12221       | 1923     | 0                     |
| 2'06      | 0'52371       | -1626    | +9                    | 2'56      | 0'01216       | -285     | +16                   | 3'06      | 0'28004       | +1291    | +12                   | 3'56      | 1'14144       | +1921    | -2                    |
| 07        | 0'50754       | 1608     | 9                     | 57        | 0'00947       | 251      | 18                    | 07        | 0'29307       | 1316     | 13                    | 57        | 1'16063       | 1919     | 1                     |
| 08        | 0'49155       | 1591     | 9                     | 58        | 0'00714       | 217      | 16                    | 08        | 0'30635       | 1340     | 12                    | 58        | 1'17981       | 1917     | 2                     |
| 09        | 0'47573       | 1573     | 10                    | 59        | 0'00513       | 185      | 17                    | 09        | 0'31986       | 1365     | 14                    | 59        | 1'19896       | 1913     | 3                     |
| 10        | 0'46010       | 1554     | 10                    | 60        | 0'00345       | 151      | 18                    | 10        | 0'33364       | 1390     | 12                    | 60        | 1'21806       | 1908     | 3                     |
| 2'11      | 0'44466       | -1535    | +10                   | 2'61      | 0'00212       | -116     | +17                   | 3'11      | 0'34766       | +1414    | +12                   | 3'61      | 1'23711       | +1902    | -3                    |
| 12        | 0'42941       | 1515     | 11                    | 62        | 0'00113       | 83       | 16                    | 12        | 0'36191       | 1436     | 11                    | 62        | 1'25610       | 1897     | 2                     |
| 13        | 0'41437       | 1494     | 11                    | 63        | 0'00046       | 50       | 17                    | 13        | 0'37638       | 1458     | 11                    | 63        | 1'27505       | 1891     | 4                     |
| 14        | 0'39954       | 1474     | 10                    | 64        | 0'00013       | -17      | 17                    | 14        | 0'39107       | 1481     | 12                    | 64        | 1'29392       | 1884     | 3                     |
| 15        | 0'38490       | 1454     | 11                    | 65        | 0'00013       | +18      | 18                    | 15        | 0'40599       | 1503     | 11                    | 65        | 1'31273       | 1877     | 5                     |
| 2'16      | 0'37047       | -1431    | +12                   | 2'66      | 0'00048       | +53      | +18                   | 3'16      | 0'42112       | +1524    | +11                   | 3'66      | 1'33145       | +1869    | -4                    |
| 17        | 0'35628       | 1408     | 11                    | 67        | 0'00118       | 87       | 17                    | 17        | 0'43646       | 1545     | 11                    | 67        | 1'35010       | 1861     | 5                     |
| 18        | 0'34231       | 1386     | 11                    | 68        | 0'00221       | 120      | 17                    | 18        | 0'45201       | 1565     | 10                    | 68        | 1'36866       | 1851     | 6                     |
| 19        | 0'32856       | 1364     | 11                    | 69        | 0'00357       | 153      | 17                    | 19        | 0'46776       | 1585     | 10                    | 69        | 1'38711       | 1841     | 4                     |
| 20        | 0'31503       | 1341     | 13                    | 70        | 0'00527       | 187      | 17                    | 20        | 0'48371       | 1605     | 10                    | 70        | 1'40548       | 1831     | 7                     |
| 2'21      | 0'30175       | -1316    | +12                   | 2'71      | 0'00730       | +221     | +18                   | 3'21      | 0'49986       | +1624    | +9                    | 3'71      | 1'42372       | +1819    | -5                    |
| 22        | 0'28871       | 1292     | 12                    | 72        | 0'00968       | 254      | 16                    | 22        | 0'51618       | 1641     | 9                     | 72        | 1'44186       | 1809     | 6                     |
| 23        | 0'27591       | 1268     | 13                    | 73        | 0'01237       | 287      | 18                    | 23        | 0'53268       | 1659     | 9                     | 73        | 1'45989       | 1796     | 7                     |
| 24        | 0'26336       | 1243     | 13                    | 74        | 0'01541       | 321      | 17                    | 24        | 0'54936       | 1677     | 9                     | 74        | 1'47778       | 1783     | 6                     |
| 25        | 0'25106       | 1217     | 13                    | 75        | 0'01878       | 355      | 18                    | 25        | 0'56622       | 1694     | 8                     | 75        | 1'49555       | 1770     | 8                     |
| 2'26      | 0'23902       | -1192    | +13                   | 2'76      | 0'02250       | +388     | +16                   | 3'26      | 0'58323       | +1709    | +8                    | 3'76      | 1'51317       | +1756    | -7                    |
| 27        | 0'22723       | 1166     | 13                    | 77        | 0'02654       | 421      | 17                    | 27        | 0'60040       | 1725     | 8                     | 77        | 1'53066       | 1742     | 7                     |
| 28        | 0'21570       | 1139     | 14                    | 78        | 0'03092       | 454      | 16                    | 28        | 0'61772       | 1740     | 8                     | 78        | 1'54801       | 1727     | 9                     |
| 29        | 0'20445       | 1112     | 13                    | 79        | 0'03562       | 487      | 17                    | 29        | 0'63520       | 1755     | 7                     | 79        | 1'56519       | 1711     | 7                     |
| 30        | 0'19346       | 1085     | 14                    | 80        | 0'04065       | 519      | 16                    | 30        | 0'65281       | 1768     | 7                     | 80        | 1'58223       | 1695     | 9                     |
| 2'31      | 0'18275       | -1057    | +14                   | 2'81      | 0'04600       | +552     | +17                   | 3'31      | 0'67055       | +1782    | +8                    | 3'81      | 1'59909       | +1678    | -9                    |
| 32        | 0'17232       | 1030     | 13                    | 82        | 0'05169       | 586      | 17                    | 32        | 0'68844       | 1796     | 7                     | 82        | 1'61578       | 1661     | 9                     |
| 33        | 0'16215       | 1003     | 14                    | 83        | 0'05772       | 618      | 15                    | 33        | 0'70646       | 1808     | 6                     | 83        | 1'63230       | 1644     | 9                     |
| 34        | 0'15226       | 974      | 16                    | 84        | 0'06404       | 649      | 17                    | 34        | 0'72459       | 1819     | 6                     | 84        | 1'64865       | 1625     | 10                    |
| 35        | 0'14268       | 944      | 14                    | 85        | 0'07069       | 681      | 16                    | 35        | 0'74284       | 1829     | 4                     | 85        | 1'66480       | 1605     | 10                    |
| 2'36      | 0'13338       | -915     | +15                   | 2'86      | 0'07765       | +712     | +16                   | 3'36      | 0'76117       | +1839    | +6                    | 3'86      | 1'68075       | +1586    | -9                    |
| 37        | 0'12438       | 885      | 15                    | 87        | 0'08492       | 744      | 17                    | 37        | 0'77962       | 1851     | 6                     | 87        | 1'69652       | 1568     | 10                    |
| 38        | 0'11568       | 856      | 15                    | 88        | 0'09253       | 776      | 15                    | 38        | 0'79818       | 1860     | 4                     | 88        | 1'71210       | 1547     | 11                    |
| 39        | 0'10727       | 827      | 15                    | 89        | 0'10044       | 807      | 16                    | 39        | 0'81682       | 1868     | 4                     | 89        | 1'72746       | 1525     | 11                    |
| 40        | 0'09915       | 796      | 16                    | 90        | 0'10867       | 838      | 15                    | 40        | 0'83553       | 1876     | 5                     | 90        | 1'74260       | 1505     | 10                    |
| 2'41      | 0'09135       | -766     | +15                   | 2'91      | 0'11719       | +868     | +16                   | 3'41      | 0'85433       | +1884    | +4                    | 3'91      | 1'75755       | +1483    | -12                   |
| 42        | 0'08384       | 736      | 16                    | 92        | 0'12602       | 898      | 15                    | 42        | 0'87321       | 1891     | 3                     | 92        | 1'77226       | 1461     | 10                    |
| 43        | 0'07664       | 703      | 17                    | 93        | 0'13515       | 929      | 16                    | 43        | 0'89214       | 1896     | 3                     | 93        | 1'78677       | 1439     | 13                    |
| 44        | 0'06978       | 672      | 15                    | 94        | 0'14459       | 959      | 15                    | 44        | 0'91113       | 1902     | 3                     | 94        | 1'80103       | 1414     | 12                    |
| 45        | 0'06321       | 642      | 16                    | 95        | 0'15432       | 988      | 15                    | 45        | 0'93018       | 1907     | 2                     | 95        | 1'81505       | 1391     | 11                    |
| 2'46      | 0'05695       | -610     | +16                   | 2'96      | 0'16435       | +1017    | +14                   | 3'46      | 0'94927       | +1911    | +2                    | 3'96      | 1'82885       | +1369    | -12                   |
| 47        | 0'05101       | 579      | 16                    | 97        | 0'17466       | 1046     | 15                    | 47        | 0'96840       | 1916     | 3                     | 97        | 1'84242       | 1344     | 14                    |
| 48        | 0'04538       | 546      | 17                    | 98        | 0'18527       | 1075     | 14                    | 48        | 0'98758       | 1919     | 1                     | 98        | 1'85572       | 1318     | 12                    |
| 49        | 0'04009       | 513      | 16                    | 99        | 0'19615       | 1103     | 15                    | 49        | 1'00678       | 1921     | 1                     | 99        | 1'86878       | 1293     | 13                    |
| 2'50      | 0'03512       | -481     | +16                   | 3'00      | 0'20732       | +1130    | +13                   | 3'50      | 1'02600       | +1923    | +1                    | 4'00      | 1'88158       | +1267    | -14                   |

Applied Constant: +1°07500.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Equation of Longitude

Argument A

| A    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | A    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | A    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | A    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ |
|------|----------|----------|-----------------------|------|----------|----------|-----------------------|------|----------|----------|-----------------------|------|----------|----------|-----------------------|
| 4 00 | 1 88158  | + 1 67   | - 14                  | 4 50 | 1 3515   | - 313    | - 17                  | 5 00 | 1 61148  | - 1641   | - 9                   | 5 50 | 0 69923  | - 1768   | + 7                   |
| 01   | 1 89411  | 1 41     | 13                    | 51   | 1 3185   | 347      | 17                    | 01   | 1 59499  | 1657     | 8                     | 51   | 0 6816   | 1756     | 6                     |
| 02   | 1 9 639  | 1 15     | 13                    | 52   | 1 8 1    | 381      | 17                    | 02   | 1 57834  | 1673     | 8                     | 52   | 0 6641   | 1744     | 7                     |
| 03   | 1 91841  | 1189     | 14                    | 53   | 1 4 4    | 414      | 17                    | 03   | 1 56154  | 1689     | 9                     | 53   | 0 64675  | 1730     | 7                     |
| 04   | 1 93 16  | 1161     | 14                    | 54   | 2 11994  | 446      | 16                    | 04   | 1 54457  | 1704     | 7                     | 54   | 0 6 95   | 1716     | 7                     |
| 05   | 1 94163  | 1133     | 14                    | 55   | 2 11532  | 478      | 16                    | 05   | 1 52747  | 1717     | 7                     | 55   | 0 61243  | 1703     | 7                     |
| 4 06 | 1 95 8   | + 11 5   | - 14                  | 4 56 | 1 1039   | - 510    | - 17                  | 5 06 | 1 51023  | - 1731   | - 7                   | 5 56 | 0 59547  | - 1688   | + 9                   |
| 07   | 1 96373  | 1 78     | 14                    | 57   | 2 10512  | 544      | 17                    | 07   | 1 49286  | 1745     | 8                     | 57   | 0 57868  | 1671     | 8                     |
| 08   | 97437    | 1 49     | 15                    | 58   | 09952    | 575      | 15                    | 08   | 1 47534  | 1757     | 5                     | 58   | 0 56 05  | 1656     | 7                     |
| 09   | 1 98471  | 1020     | 15                    | 59   | 2 0936   | 606      | 16                    | 09   | 1 45772  | 1769     | 7                     | 59   | 0 54556  | 1640     | 8                     |
| 10   | 1 99476  | 990      | 15                    | 60   | 2 08740  | 639      | 17                    | 10   | 1 43997  | 1781     | 6                     | 60   | 0 5 925  | 1622     | 10                    |
| 4 11 | 00451    | + 96     | - 14                  | 4 61 | 08084    | - 671    | - 15                  | 5 11 | 1 4 211  | 1791     | - 5                   | 5 61 | 0 51313  | - 1605   | + 9                   |
| 12   | 2 01398  | 93       | 15                    | 62   | 2 07398  | 701      | 15                    | 12   | 1 40415  | 180      | 6                     | 62   | 0 49716  | 1588     | 10                    |
| 13   | 0 315    | 901      | 16                    | 63   | 0668     | 731      | 15                    | 13   | 1 38608  | 1811     | 4                     | 63   | 0 48138  | 1563     | 9                     |
| 14   | 03 00    | 871      | 15                    | 64   | 05936    | 76       | 14                    | 14   | 1 36793  | 18 1     | 6                     | 64   | 0 46578  | 1550     | 10                    |
| 15   | 2 04056  | 841      | 16                    | 65   | 05158    | 794      | 16                    | 15   | 1 34967  | 1830     | 4                     | 65   | 0 45038  | 1531     | 9                     |
| 4 16 | 04881    | + 810    | - 16                  | 4 66 | 04349    | - 824    | - 15                  | 5 16 | 1 33134  | - 1838   | - 5                   | 5 66 | 0 43516  | - 1511   | + 11                  |
| 17   | 05675    | 778      | 16                    | 67   | 03511    | 85       | 15                    | 17   | 1 31292  | 1846     | 4                     | 67   | 0 42016  | 1490     | 11                    |
| 18   | 2 06437  | 747      | 15                    | 68   | 2 0 643  | 883      | 15                    | 18   | 1 29442  | 1853     | 3                     | 68   | 0 40537  | 1469     | 11                    |
| 19   | 2 07169  | 716      | 16                    | 69   | 01745    | 912      | 14                    | 19   | 1 27587  | 1859     | 4                     | 69   | 0 39 79  | 1448     | 10                    |
| 20   | 2 7869   | 684      | 16                    | 70   | 00819    | 941      | 15                    | 20   | 1 25725  | 1864     | 2                     | 70   | 0 37641  | 1427     | 12                    |
| 4 21 | 2 08537  | + 65     | - 16                  | 4 71 | 1 99863  | - 970    | - 14                  | 5 21 | 1 23859  | - 1869   | - 3                   | 5 71 | 0 36226  | - 1404   | + 12                  |
| 22   | 09173    | 6 0      | 17                    | 72   | 1 98879  | 999      | 15                    | 22   | 1 1987   | 1875     | 3                     | 72   | 0 34834  | 1382     | 11                    |
| 23   | 2 09776  | 587      | 16                    | 73   | 1 97865  | 10 8     | 14                    | 23   | 1 20110  | 1879     | 2                     | 73   | 0 33463  | 1359     | 13                    |
| 24   | 1 347    | 5 5      | 16                    | 74   | 1 968 4  | 1 55     | 14                    | 24   | 1 18229  | 1883     | 2                     | 74   | 0 3 117  | 1336     | 11                    |
| 25   | 2 10886  | 5 3      | 16                    | 75   | 1 95755  | 1083     | 14                    | 25   | 1 16345  | 1886     | 2                     | 75   | 0 30792  | 131      | 14                    |
| 4 26 | 2 11393  | + 491    | - 17                  | 4 76 | 1 94659  | - 1110   | - 14                  | 5 26 | 1 14458  | - 1888   | - 1                   | 5 76 | 0 29494  | - 1287   | + 12                  |
| 27   | 11867    | 457      | 17                    | 77   | 1 93536  | 1137     | 14                    | 27   | 1 12570  | 1889     | 1                     | 77   | 0 28 19  | 1262     | 13                    |
| 28   | 2 12307  | 424      | 16                    | 78   | 1 92385  | 1164     | 13                    | 28   | 1 10681  | 1890     | 1                     | 78   | 0 26970  | 1 37     | 13                    |
| 29   | 1 715    | 391      | 18                    | 79   | 1 91 09  | 1189     | 13                    | 29   | 1 08790  | 189      | - 1                   | 79   | 0 5746   | 1211     | 13                    |
| 30   | 13088    | 357      | 17                    | 80   | 1 90007  | 1215     | 13                    | 30   | 1 6898   | 1891     | + 1                   | 80   | 0 4548   | 1186     | 13                    |
| 4 31 | 13428    | + 324    | - 17                  | 4 81 | 1 88779  | - 1241   | - 13                  | 5 31 | 1 05008  | 1890     | 0                     | 5 81 | 0 23375  | - 1160   | + 14                  |
| 32   | 2 13735  | 91       | 17                    | 82   | 1 87526  | 1265     | 12                    | 32   | 1 03118  | 1889     | + 1                   | 82   | 0 2 229  | 1133     | 13                    |
| 33   | 14 09    | 58       | 17                    | 83   | 1 86 49  | 1 91     | 14                    | 33   | 1 01 30  | 1888     | 1                     | 83   | 0 21109  | 11 6     | 15                    |
| 34   | 14 50    | 24       | 17                    | 84   | 1 84945  | 1315     | 11                    | 34   | 0 99343  | 1885     | 2                     | 84   | 0 20018  | 1078     | 14                    |
| 35   | 14457    | 190      | 17                    | 85   | 1 83620  | 1337     | 12                    | 35   | 0 97460  | 1882     | 2                     | 85   | 0 18954  | 1050     | 14                    |
| 4 36 | 14630    | + 156    | - 18                  | 4 86 | 1 82271  | - 1361   | - 12                  | 5 36 | 95580    | - 1878   | + 2                   | 5 86 | 0 17918  | - 1023   | + 14                  |
| 37   | 2 14768  | 121      | 17                    | 87   | 1 80898  | 1385     | 1                     | 37   | 93704    | 1874     | 2                     | 87   | 0 16909  | 994      | 16                    |
| 38   | 2 14872  | 88       | 16                    | 88   | 1 79502  | 1407     | 11                    | 38   | 91832    | 187      |                       | 88   | 0 15931  | 964      | 14                    |
| 39   | 14945    | 56       | 18                    | 89   | 1 78084  | 14 9     | 11                    | 39   | 0 89964  | 1865     | 4                     | 89   | 0 14981  | 937      | 14                    |
| 40   | 14983    | + 1      | 17                    | 90   | 1 76645  | 1450     | 11                    | 40   | 0 88103  | 1858     | 3                     | 90   | 0 14058  | 908      | 16                    |
| 4 41 | 14987    | - 13     | - 17                  | 4 91 | 1 75184  | - 1472   | - 11                  | 5 41 | 0 86248  | - 1852   | + 4                   | 5 91 | 0 13166  | - 877    | + 16                  |
| 42   | 14958    | 46       | 17                    | 92   | 1 73701  | 1493     | 10                    | 42   | 0 84400  | 1845     | 3                     | 92   | 0 1 304  | 848      | 15                    |
| 43   | 2 14895  | 80       | 16                    | 93   | 1 72198  | 1513     | 10                    | 43   | 0 8 558  | 1838     | 5                     | 93   | 0 11471  | 818      | 16                    |
| 44   | 14799    | 114      | 18                    | 94   | 1 70676  | 153      | 10                    | 44   | 0 80724  | 1829     | 5                     | 94   | 0 10669  | 787      | 15                    |
| 45   | 14668    | 148      | 17                    | 95   | 1 69134  | 155      | 10                    | 45   | 0 78900  | 1820     | 4                     | 95   | 0 09897  | 756      | 16                    |
| 4 46 | 14504    | 181      | - 17                  | 4 96 | 1 6757   | - 1571   | - 9                   | 5 46 | 0 77084  | - 1811   | + 5                   | 5 96 | 0 09157  | - 725    | + 16                  |
| 47   | 14306    | 214      | 16                    | 97   | 1 65993  | 1588     | 9                     | 47   | 0 75279  | 1801     | 5                     | 97   | 0 08448  | 694      | 15                    |
| 48   | 14076    | 48       | 18                    | 98   | 1 64396  | 1607     | 10                    | 48   | 0 73483  | 1791     | 5                     | 98   | 0 07769  | 664      | 16                    |
| 49   | 2 13811  | 281      | 16                    | 99   | 1 62780  | 16 4     | 8                     | 49   | 0 71697  | 1780     | 6                     | 99   | 0 07121  | 632      | 17                    |
| 4 50 | 2 13515  | - 313    | - 17                  | 5 00 | 1 61148  | - 1641   | - 9                   | 5 50 | 0 69923  | - 1768   | + 7                   | 6 00 | 0 06506  | - 599    | + 16                  |



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Equation of Longitude

Argument A

| 1         | 2             | 3        | 4                      | 1         | 2             | 3        | 4                      | 1         | 2             | 3        | 4                      | 1         | 2             | 3        | 4                      |
|-----------|---------------|----------|------------------------|-----------|---------------|----------|------------------------|-----------|---------------|----------|------------------------|-----------|---------------|----------|------------------------|
| A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ | A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ | A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ | A         | Equa-<br>tion | $\Delta$ | $\frac{1}{2} \Delta^2$ |
| d<br>6'00 | 0'06506       | - 599    | + 16                   | d<br>6'50 | 0'18060       | + 1040   | + 14                   | d<br>7'00 | 0'97665       | + 1926   | + 2                    | d<br>7'50 | 1'84895       | + 1319   | - 12                   |
| 01        | 0'05923       | 568      | 16                     | 51        | 0'19114       | 1068     | 14                     | 01        | 0'99593       | 1929     | 1                      | 51        | 1'86202       | 1294     | 14                     |
| 02        | 0'05371       | 536      | 17                     | 52        | 0'20195       | 1097     | 16                     | 02        | 1'01522       | 1931     | 2                      | 52        | 1'87482       | 1267     | 13                     |
| 03        | 0'04852       | 503      | 17                     | 53        | 0'21307       | 1127     | 15                     | 03        | 1'03454       | 1933     | 1                      | 53        | 1'88736       | 1242     | 13                     |
| 04        | 0'04366       | 470      | 17                     | 54        | 0'22448       | 1155     | 14                     | 04        | 1'05387       | 1934     | + 1                    | 54        | 1'89965       | 1215     | 15                     |
| 05        | 0'03913       | 437      | 16                     | 55        | 0'23616       | 1182     | 14                     | 05        | 1'07321       | 1934     | - 1                    | 55        | 1'91165       | 1187     | 14                     |
| 6'06      | 0'03492       | - 404    | + 17                   | 6'56      | 0'24811       | + 1208   | + 13                   | 7'06      | 1'09254       | + 1934   | + 1                    | 7'56      | 1'92338       | + 1160   | - 14                   |
| 07        | 0'03105       | 371      | 17                     | 57        | 0'26032       | 1236     | 15                     | 07        | 1'11188       | 1933     | - 1                    | 57        | 1'93484       | 1132     | 15                     |
| 08        | 0'02751       | 338      | 16                     | 58        | 0'27282       | 1264     | 14                     | 08        | 1'13120       | 1931     | 1                      | 58        | 1'94601       | 1103     | 15                     |
| 09        | 0'02429       | 305      | 17                     | 59        | 0'28559       | 1290     | 13                     | 09        | 1'15050       | 1929     | 1                      | 59        | 1'95689       | 1074     | 15                     |
| 10        | 0'02141       | 272      | 17                     | 60        | 0'29861       | 1315     | 13                     | 10        | 1'16978       | 1926     | 2                      | 60        | 1'96748       | 1044     | 15                     |
| 6'11      | 0'01886       | - 238    | + 17                   | 6'61      | 0'31188       | + 1340   | + 13                   | 7'11      | 1'18902       | + 1922   | - 2                    | 7'61      | 1'97777       | + 1015   | - 14                   |
| 12        | 0'01665       | 204      | 17                     | 62        | 0'32541       | 1365     | 12                     | 12        | 1'20822       | 1919     | 2                      | 62        | 1'98778       | 986      | 15                     |
| 13        | 0'01478       | 171      | 16                     | 63        | 0'33918       | 1390     | 13                     | 13        | 1'22739       | 1914     | 4                      | 63        | 1'99749       | 956      | 15                     |
| 14        | 0'01323       | 138      | 17                     | 64        | 0'35320       | 1414     | 12                     | 14        | 1'24649       | 1908     | 3                      | 64        | 2'00690       | 927      | 15                     |
| 15        | 0'01202       | 104      | 18                     | 65        | 0'36745       | 1437     | 12                     | 15        | 1'26554       | 1902     | 4                      | 65        | 2'01602       | 895      | 17                     |
| 6'16      | 0'01116       | - 69     | + 18                   | 6'66      | 0'38194       | + 1461   | + 12                   | 7'16      | 1'28452       | + 1895   | - 3                    | 7'66      | 2'02480       | + 864    | - 15                   |
| 17        | 0'01065       | 35       | 17                     | 67        | 0'39666       | 1484     | 12                     | 17        | 1'30344       | 1888     | 4                      | 67        | 2'03329       | 833      | 16                     |
| 18        | 0'01047       | - 2      | 17                     | 68        | 0'41161       | 1506     | 11                     | 18        | 1'32228       | 1880     | 4                      | 68        | 2'04146       | 802      | 16                     |
| 19        | 0'01062       | + 33     | 18                     | 69        | 0'42678       | 1527     | 10                     | 19        | 1'34104       | 1872     | 5                      | 69        | 2'04932       | 771      | 16                     |
| 20        | 0'01113       | 68       | 17                     | 70        | 0'44215       | 1548     | 11                     | 20        | 1'35971       | 1862     | 5                      | 70        | 2'05687       | 739      | 16                     |
| 6'21      | 0'01197       | + 101    | + 17                   | 6'71      | 0'45774       | + 1570   | + 11                   | 7'21      | 1'37828       | + 1852   | - 5                    | 7'71      | 2'06410       | + 707    | - 17                   |
| 22        | 0'01315       | 134      | 16                     | 72        | 0'47354       | 1591     | 11                     | 22        | 1'39675       | 1841     | 6                      | 72        | 2'07100       | 674      | 16                     |
| 23        | 0'01465       | 168      | 18                     | 73        | 0'48955       | 1610     | 9                      | 23        | 1'41510       | 1830     | 6                      | 73        | 2'07758       | 642      | 16                     |
| 24        | 0'01650       | 203      | 18                     | 74        | 0'50574       | 1628     | 9                      | 24        | 1'43334       | 1819     | 6                      | 74        | 2'08384       | 610      | 16                     |
| 25        | 0'01870       | 237      | 17                     | 75        | 0'52211       | 1648     | 11                     | 25        | 1'45147       | 1807     | 7                      | 75        | 2'08978       | 578      | 17                     |
| 6'26      | 0'02124       | + 272    | + 18                   | 6'76      | 0'53869       | + 1666   | + 8                    | 7'26      | 1'46947       | + 1794   | - 6                    | 7'76      | 2'09539       | + 545    | - 17                   |
| 27        | 0'02413       | 305      | 16                     | 77        | 0'55543       | 1683     | 9                      | 27        | 1'48735       | 1781     | 8                      | 77        | 2'10067       | 511      | 17                     |
| 28        | 0'02734       | 337      | 16                     | 78        | 0'57235       | 1700     | 8                      | 28        | 1'50508       | 1766     | 8                      | 78        | 2'10561       | 477      | 17                     |
| 29        | 0'03087       | 371      | 18                     | 79        | 0'58943       | 1717     | 9                      | 29        | 1'52266       | 1751     | 7                      | 79        | 2'11021       | 444      | 17                     |
| 30        | 0'03475       | 406      | 17                     | 80        | 0'60669       | 1734     | 8                      | 30        | 1'54010       | 1736     | 8                      | 80        | 2'11448       | 412      | 16                     |
| 6'31      | 0'03897       | + 439    | + 17                   | 6'81      | 0'62410       | + 1749   | + 8                    | 7'31      | 1'55738       | + 1720   | - 9                    | 7'81      | 2'11844       | + 378    | - 18                   |
| 32        | 0'04352       | 471      | 16                     | 82        | 0'64166       | 1764     | 8                      | 32        | 1'57449       | 1703     | 8                      | 82        | 2'12204       | 344      | 17                     |
| 33        | 0'04839       | 504      | 17                     | 83        | 0'65937       | 1778     | 7                      | 33        | 1'59144       | 1687     | 9                      | 83        | 2'12531       | 311      | 16                     |
| 34        | 0'05360       | 538      | 17                     | 84        | 0'67721       | 1791     | 7                      | 34        | 1'60822       | 1669     | 9                      | 84        | 2'12826       | 277      | 18                     |
| 35        | 0'05915       | 572      | 17                     | 85        | 0'69518       | 1803     | 6                      | 35        | 1'62482       | 1651     | 9                      | 85        | 2'13085       | 243      | 16                     |
| 6'36      | 0'06503       | + 604    | + 16                   | 6'86      | 0'71327       | + 1816   | + 7                    | 7'36      | 1'64124       | + 1633   | - 9                    | 7'86      | 2'13312       | + 208    | - 18                   |
| 37        | 0'07122       | 637      | 18                     | 87        | 0'73150       | 1829     | 6                      | 37        | 1'65748       | 1614     | 11                     | 87        | 2'13503       | 174      | 17                     |
| 38        | 0'07776       | 670      | 16                     | 88        | 0'74984       | 1840     | 6                      | 38        | 1'67351       | 1593     | 11                     | 88        | 2'13660       | 141      | 16                     |
| 39        | 0'08461       | 700      | 15                     | 89        | 0'76829       | 1850     | 5                      | 39        | 1'68933       | 1573     | 10                     | 89        | 2'13785       | 107      | 18                     |
| 40        | 0'09176       | 732      | 17                     | 90        | 0'78684       | 1860     | 5                      | 40        | 1'70496       | 1553     | 11                     | 90        | 2'13874       | 73       | 16                     |
| 6'41      | 0'09925       | + 765    | + 16                   | 6'91      | 0'80549       | + 1870   | + 5                    | 7'41      | 1'72038       | + 1531   | - 11                   | 7'91      | 2'13931       | + 40     | - 17                   |
| 42        | 0'10706       | 797      | 16                     | 92        | 0'82424       | 1878     | 3                      | 42        | 1'73559       | 1510     | 11                     | 92        | 2'13954       | + 6      | 18                     |
| 43        | 0'11519       | 828      | 15                     | 93        | 0'84305       | 1886     | 5                      | 43        | 1'75058       | 1489     | 11                     | 93        | 2'13942       | - 29     | 17                     |
| 44        | 0'12361       | 858      | 16                     | 94        | 0'86196       | 1894     | 3                      | 44        | 1'76536       | 1465     | 13                     | 94        | 2'13896       | 64       | 18                     |
| 45        | 0'13235       | 889      | 15                     | 95        | 0'88093       | 1901     | 4                      | 45        | 1'77988       | 1441     | 11                     | 95        | 2'13815       | 98       | 17                     |
| 6'46      | 0'14139       | + 919    | + 15                   | 6'96      | 0'89998       | + 1907   | + 2                    | 7'46      | 1'79418       | + 1419   | - 12                   | 7'96      | 2'13701       | - 130    | - 16                   |
| 47        | 0'15073       | 950      | 16                     | 97        | 0'91907       | 1912     | 3                      | 47        | 1'80825       | 1395     | 12                     | 97        | 2'13555       | 164      | 18                     |
| 48        | 0'16039       | 981      | 15                     | 98        | 0'93822       | 1917     | 2                      | 48        | 1'82208       | 1370     | 14                     | 98        | 2'13374       | 198      | 17                     |
| 49        | 0'17034       | 1011     | 16                     | 99        | 0'95741       | 1922     | 3                      | 49        | 1'83564       | 1344     | 13                     | 99        | 2'13159       | 232      | 17                     |
| 6'50      | 0'18060       | + 1040   | + 14                   | 7'00      | 0'97665       | + 1926   | + 2                    | 7'50      | 1'84895       | + 1319   | - 12                   | 8'00      | 2'12910       | - 266    | - 17                   |

Applied Constant: +1'07500.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

XIII

| B  | Equation | $\Delta$ |
|----|----------|----------|
| 00 | 000100   | + 6      |
| 1  | 106      | 5        |
| 2  | 110      | 3        |
| 3  | 11       | + 1      |
| 4  | 111      | -        |
| 5  | 107      | 6        |
| 06 | 0001     | - 9      |
| 7  | 89       | 1        |
| 8  | 76       | 14       |
| 9  | 6        | 14       |
| 10 | 47       | 15       |
| 11 | 00034    | - 13     |
| 2  | 2        | 1        |
| 3  | 1        | 8        |
| 4  | 6        | - 4      |
| 5  | 5        | + 1      |
| 16 | 000007   | + 4      |
| 7  | 13       | 8        |
| 8  | 3        | 11       |
| 9  | 36       | 15       |
| 20 | 5        | 17       |
| 21 | 000070   | + 19     |
| 2  | 89       | 19       |
| 3  | 19       | 21       |
| 4  | 128      | 18       |
| 5  | 146      | 17       |
| 26 | 00016    | + 15     |
| 7  | 176      | 12       |
| 8  | 186      | 9        |
| 9  | 19       | 4        |
| 30 | 195      | +        |
| 31 | 000194   | - 4      |
| 2  | 189      | 7        |
| 3  | 180      | 11       |
| 4  | 168      | 13       |
| 5  | 154      | 14       |
| 36 | 00140    | - 15     |
| 7  | 15       | 13       |
| 8  | 11       | 1        |
| 9  | 1        | 10       |
| 40 | 94       | 6        |
| 41 | 000089   | - 3      |
| 2  | 89       | + 1      |
| 3  | 90       | 3        |
| 4  | 94       | 5        |
| 5  | 99       | 5        |
| 46 | 000105   | + 5      |
| 7  | 109      | 4        |
| 8  | 112      | + 1      |
| 9  | 111      | -        |
| 50 | 000108   | - 4      |

Appli 10 t t + ∞

XIV

| C   | Equation | $\Delta$ |
|-----|----------|----------|
| 000 | 00010    | + 15     |
| 08  | 113      | 16       |
| 16  | 126      | 16       |
| 24  | 138      | 15       |
| 32  | 149      | 14       |
| 40  | 160      | 11       |
| 048 | 000169   | + 11     |
| 56  | 177      | 09       |
| 64  | 183      | 08       |
| 72  | 188      | 05       |
| 80  | 191      | + 03     |
| 088 | 000192   | 00       |
| 96  | 191      | - 3      |
| 104 | 189      | 04       |
| 12  | 184      | 06       |
| 20  | 178      | 09       |
| 128 | 000171   | - 10     |
| 36  | 162      | 13       |
| 44  | 152      | 14       |
| 52  | 141      | 14       |
| 60  | 129      | 16       |
| 168 | 000116   | - 16     |
| 76  | 103      | 15       |
| 84  | 90       | 16       |
| 92  | 77       | 16       |
| 200 | 65       | 15       |
| 208 | 000053   | - 14     |
| 16  | 43       | 13       |
| 24  | 33       | 11       |
| 32  | 25       | 10       |
| 40  | 18       | 08       |
| 248 | 000013   | - 05     |
| 56  | 10       | 04       |
| 64  | 8        | - 01     |
| 72  | 8        | + 01     |
| 80  | 1        | 04       |
| 288 | 000014   | + 06     |
| 96  | 20       | 08       |
| 304 | 7        | 10       |
| 12  | 36       | 13       |
| 20  | 46       | 13       |
| 328 | 000051   | + 15     |
| 36  | 69       | 15       |
| 44  | 81       | 15       |
| 52  | 94       | 16       |
| 60  | 107      | 16       |
| 368 | 000120   | + 16     |
| 76  | 13       | 15       |
| 84  | 144      | 15       |
| 92  | 155      | 13       |
| 400 | 000165   | + 13     |

Appli dC t t +

XV

| D   | Equation | $\Delta$ |
|-----|----------|----------|
| 000 | 00100    | + 170    |
| 04  | 1067     | 165      |
| 08  | 1133     | 165      |
| 12  | 1199     | 165      |
| 16  | 1264     | 160      |
| 20  | 1327     | 155      |
| 024 | 001389   | + 155    |
| 28  | 1449     | 145      |
| 32  | 1507     | 143      |
| 36  | 1562     | 133      |
| 40  | 1614     | 18       |
| 044 | 001663   | + 120    |
| 48  | 1709     | 110      |
| 52  | 1751     | 100      |
| 56  | 1790     | 93       |
| 60  | 1825     | 83       |
| 064 | 001855   | + 70     |
| 68  | 1882     | 60       |
| 72  | 1903     | 50       |
| 76  | 1921     | 38       |
| 80  | 1933     | 25       |
| 084 | 00194    | + 15     |
| 88  | 1945     | + 3      |
| 92  | 1943     | - 10     |
| 96  | 1937     | 20       |
| 100 | 1927     | 35       |
| 104 | 001911   | - 43     |
| 08  | 1891     | 55       |
| 12  | 1867     | 68       |
| 16  | 1838     | 78       |
| 20  | 1805     | 88       |
| 124 | 001768   | - 98     |
| 28  | 177      | 108      |
| 32  | 1683     | 115      |
| 36  | 1635     | 123      |
| 40  | 1583     | 133      |
| 144 | 001530   | 138      |
| 48  | 1473     | 145      |
| 52  | 1414     | 150      |
| 56  | 1353     | 155      |
| 60  | 1300     | 16       |
| 164 | 001226   | - 163    |
| 68  | 1160     | 165      |
| 72  | 1094     | 168      |
| 76  | 1027     | 168      |
| 80  | 96       | 168      |
| 184 | 000894   | - 165    |
| 88  | 88       | 165      |
| 92  | 763      | 16       |
| 96  | 699      | 160      |
| 200 | 000636   | - 155    |
| 200 | 000636   | - 155    |
| 04  | 576      | 148      |
| 08  | 517      | 143      |
| 12  | 460      | 140      |
| 16  | 407      | 130      |
| 20  | 357      | 13       |
| 224 | 000309   | - 113    |
| 28  | 65       | 105      |
| 32  | 25       | 95       |
| 36  | 189      | 88       |
| 40  | 157      | 75       |
| 244 | 00019    | - 65     |
| 48  | 105      | 53       |
| 52  | 86       | 43       |
| 56  | 71       | 30       |
| 60  | 61       | 20       |
| 264 | 000056   | - 08     |
| 68  | 55       | + 05     |
| 72  | 60       | 15       |
| 76  | 68       | 30       |
| 80  | 82       | 35       |
| 284 | 000100   | + 53     |
| 88  | 13       | 63       |
| 92  | 150      | 73       |
| 96  | 181      | 83       |
| 300 | 217      | 95       |
| 304 | 000256   | + 103    |
| 08  | 299      | 113      |
| 12  | 345      | 120      |
| 16  | 395      | 128      |
| 20  | 448      | 135      |
| 324 | 000503   | + 143    |
| 28  | 562      | 150      |
| 32  | 622      | 153      |
| 36  | 684      | 158      |
| 40  | 748      | 160      |
| 344 | 000813   | + 165    |
| 48  | 879      | 165      |
| 52  | 945      | 168      |
| 56  | 101      | 165      |
| 60  | 1079     | 168      |
| 364 | 01145    | + 165    |
| 68  | 111      | 163      |
| 72  | 1275     | 160      |
| 76  | 1338     | 155      |
| 80  | 1400     | 153      |
| 384 | 001459   | + 145    |
| 88  | 1517     | 140      |
| 92  | 1571     | 135      |
| 96  | 1623     | 125      |
| 400 | 00167    | + 115    |

Appli dC t t +



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XVI

Equations of Longitude

XVII

| 1    | 2             | 3                             | 4                      | 1    | 2             | 3                             | 4                      |
|------|---------------|-------------------------------|------------------------|------|---------------|-------------------------------|------------------------|
| E    | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> 01 | $\frac{1}{2} \Delta^2$ | E    | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> 01 | $\frac{1}{2} \Delta^2$ |
| d    | o             |                               |                        | d    | o             |                               |                        |
| 0'00 | 0'03600       | +62,4                         | -0,0                   | 2'00 | 0'02236       | -57,5                         | +0,2                   |
| 04   | 3849          | 62,2                          | 0,0                    | 04   | 2011          | 55,7                          | 0,3                    |
| 08   | 4098          | 61,8                          | 0,1                    | 08   | 1792          | 53,5                          | 0,3                    |
| 12   | 4343          | 61,0                          | 0,1                    | 12   | 1583          | 51,1                          | 0,3                    |
| 16   | 4585          | 59,9                          | 0,2                    | 16   | 1384          | 48,5                          | 0,4                    |
| 20   | 4822          | 58,5                          | 0,2                    | 20   | 1195          | 45,6                          | 0,4                    |
| 0'24 | 0'05053       | +56,9                         | -0,2                   | 2'24 | 0'01019       | -42,5                         | +0,4                   |
| 28   | 5277          | 54,9                          | 0,3                    | 28   | 856           | 39,2                          | 0,4                    |
| 32   | 5492          | 52,7                          | 0,3                    | 32   | 706           | 35,7                          | 0,5                    |
| 36   | 5698          | 50,2                          | 0,3                    | 36   | 571           | 31,9                          | 0,5                    |
| 40   | 5893          | 47,4                          | 0,4                    | 40   | 451           | 28,1                          | 0,5                    |
| 0'44 | 0'06077       | +44,3                         | -0,4                   | 2'44 | 0'00347       | -24,0                         | +0,5                   |
| 48   | 6248          | 41,2                          | 0,4                    | 48   | 259           | 19,9                          | 0,5                    |
| 52   | 6406          | 37,8                          | 0,4                    | 52   | 188           | 15,7                          | 0,5                    |
| 56   | 6550          | 34,2                          | 0,5                    | 56   | 133           | 11,4                          | 0,6                    |
| 60   | 6679          | 30,4                          | 0,5                    | 60   | 97            | 7,0                           | 0,6                    |
| 0'64 | 0'06793       | +26,7                         | -0,5                   | 2'64 | 0'00078       | -2,6                          | +0,6                   |
| 68   | 6890          | 22,4                          | 0,5                    | 68   | 76            | +1,8                          | 0,6                    |
| 72   | 6971          | 18,8                          | 0,5                    | 72   | 91            | 6,2                           | 0,6                    |
| 76   | 7036          | 14,0                          | 0,5                    | 76   | 125           | 10,6                          | 0,6                    |
| 80   | 7083          | 9,7                           | 0,6                    | 80   | 176           | 14,9                          | 0,5                    |
| 0'84 | 0'07113       | +5,3                          | -0,6                   | 2'84 | 0'00244       | +19,2                         | +0,5                   |
| 88   | 7125          | +0,9                          | 0,6                    | 88   | 329           | 23,3                          | 0,5                    |
| 92   | 7120          | -3,6                          | 0,6                    | 92   | 430           | 27,4                          | 0,5                    |
| 96   | 7097          | 7,9                           | 0,5                    | 96   | 548           | 31,3                          | 0,5                    |
| 1'00 | 7057          | 12,3                          | 0,6                    | 3'00 | 680           | 35,0                          | 0,5                    |
| 1'04 | 0'06999       | -16,6                         | -0,5                   | 3'04 | 0'00827       | +38,6                         | +0,4                   |
| 08   | 6924          | 20,8                          | 0,5                    | 08   | 988           | 41,9                          | 0,4                    |
| 12   | 6832          | 24,9                          | 0,5                    | 12   | 1162          | 45,1                          | 0,4                    |
| 16   | 6725          | 28,9                          | 0,5                    | 16   | 1348          | 48,0                          | 0,4                    |
| 20   | 6601          | 32,8                          | 0,5                    | 20   | 1546          | 50,7                          | 0,3                    |
| 1'24 | 0'06463       | -36,4                         | -0,5                   | 3'24 | 0'01754       | +53,1                         | +0,3                   |
| 28   | 6310          | 39,9                          | 0,4                    | 28   | 1971          | 55,3                          | 0,3                    |
| 32   | 6144          | 43,2                          | 0,4                    | 32   | 2196          | 57,2                          | 0,2                    |
| 36   | 5966          | 46,2                          | 0,4                    | 36   | 2428          | 58,8                          | 0,2                    |
| 40   | 5775          | 49,1                          | 0,4                    | 40   | 2666          | 60,2                          | 0,2                    |
| 1'44 | 0'05574       | -51,7                         | -0,3                   | 3'44 | 0'02909       | +61,2                         | +0,1                   |
| 48   | 5362          | 54,1                          | 0,3                    | 48   | 3156          | 61,9                          | +0,1                   |
| 52   | 5142          | 56,1                          | 0,3                    | 52   | 3404          | 62,3                          | 0,0                    |
| 56   | 4913          | 57,9                          | 0,2                    | 56   | 3654          | 62,4                          | 0,0                    |
| 60   | 4679          | 59,4                          | 0,2                    | 60   | 3903          | 62,2                          | -0,1                   |
| 1'64 | 0'04439       | -60,6                         | -0,1                   | 3'64 | 0'04151       | +61,4                         | -0,1                   |
| 68   | 4195          | 61,5                          | 0,1                    | 68   | 4396          | 60,8                          | 0,1                    |
| 72   | 3947          | 62,1                          | -0,1                   | 72   | 4637          | 59,6                          | 0,2                    |
| 76   | 3698          | 62,4                          | 0,0                    | 76   | 4872          | 58,2                          | 0,2                    |
| 80   | 3448          | 62,4                          | 0,0                    | 80   | 5102          | 56,4                          | 0,2                    |
| 1'84 | 0'03199       | -62,0                         | +0,1                   | 3'84 | 0'05323       | +54,4                         | -0,3                   |
| 88   | 2953          | 61,4                          | 0,1                    | 88   | 5537          | 52,2                          | 0,3                    |
| 92   | 2709          | 60,4                          | 0,1                    | 92   | 5740          | 49,6                          | 0,3                    |
| 96   | 2470          | 59,1                          | 0,2                    | 96   | 5933          | 46,8                          | 0,4                    |
| 2'00 | 0'02236       | -57,5                         | +0,2                   | 4'00 | 0'06113       | +43,8                         | -0,4                   |

Applied Constant: +0'03600.

| 1    | 2             | 3                             | 1    | 2             | 3                             |
|------|---------------|-------------------------------|------|---------------|-------------------------------|
| F    | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> 01 | F    | Equa-<br>tion | $\Delta$<br>0 <sup>d</sup> 01 |
| d    | o             |                               | d    | o             |                               |
| 0'00 | 0'01500       | +26,2                         | 2'00 | 0'00926       | -24,2                         |
| 04   | 1605          | 26,2                          | 04   | 831           | 23,4                          |
| 08   | 1709          | 26,0                          | 08   | 739           | 22,5                          |
| 12   | 1813          | 25,7                          | 12   | 651           | 21,5                          |
| 16   | 1914          | 25,2                          | 16   | 567           | 20,4                          |
| 20   | 2014          | 24,6                          | 20   | 488           | 19,2                          |
| 0'24 | 0'02111       | +23,9                         | 2'24 | 0'00414       | -17,9                         |
| 28   | 2205          | 23,1                          | 28   | 345           | 16,5                          |
| 32   | 2296          | 22,2                          | 32   | 282           | 15,0                          |
| 36   | 2383          | 21,1                          | 36   | 225           | 13,4                          |
| 40   | 2465          | 20,0                          | 40   | 176           | 11,8                          |
| 0'44 | 0'02542       | +18,7                         | 2'44 | 0'00132       | -10,1                         |
| 48   | 2614          | 17,4                          | 48   | 95            | 8,4                           |
| 52   | 2682          | 15,9                          | 52   | 65            | 6,6                           |
| 56   | 2742          | 14,4                          | 56   | 42            | 4,8                           |
| 60   | 2796          | 12,8                          | 60   | 27            | 2,9                           |
| 0'64 | 0'02844       | +11,1                         | 2'64 | 0'00019       | -1,1                          |
| 68   | 2884          | 9,4                           | 68   | 18            | +0,8                          |
| 72   | 2919          | 7,7                           | 72   | 24            | 2,4                           |
| 76   | 2944          | 5,9                           | 76   | 38            | 4,5                           |
| 80   | 2964          | 4,1                           | 80   | 60            | 6,3                           |
| 0'84 | 0'02977       | +2,2                          | 2'84 | 0'00088       | +8,1                          |
| 88   | 2982          | +0,4                          | 88   | 124           | 9,8                           |
| 92   | 2980          | -1,5                          | 92   | 167           | 11,5                          |
| 96   | 2970          | 3,4                           | 96   | 216           | 13,2                          |
| 1'00 | 2953          | 5,2                           | 3'00 | 272           | 14,7                          |
| 1'04 | 0'02930       | -7,0                          | 3'04 | 0'00334       | +16,2                         |
| 08   | 2898          | 8,8                           | 08   | 401           | 17,8                          |
| 12   | 2860          | 10,5                          | 12   | 475           | 19,0                          |
| 16   | 2815          | 12,2                          | 16   | 554           | 20,2                          |
| 20   | 2763          | 13,8                          | 20   | 637           | 21,3                          |
| 1'24 | 0'02705       | -15,3                         | 3'24 | 0'00724       | +22,4                         |
| 28   | 2640          | 16,8                          | 28   | 816           | 23,3                          |
| 32   | 2570          | 18,2                          | 32   | 910           | 24,1                          |
| 36   | 2494          | 19,5                          | 36   | 1008          | 24,8                          |
| 40   | 2414          | 20,7                          | 40   | 1108          | 25,3                          |
| 1'44 | 0'02329       | -21,8                         | 3'44 | 0'01210       | +25,8                         |
| 48   | 2240          | 22,7                          | 48   | 1314          | 26,1                          |
| 52   | 2147          | 23,6                          | 52   | 1418          | 26,2                          |
| 56   | 2051          | 24,4                          | 56   | 1524          | 26,3                          |
| 60   | 1952          | 25,0                          | 60   | 1628          | 26,2                          |
| 1'64 | 0'01851       | -25,5                         | 3'64 | 0'01733       | +25,9                         |
| 68   | 1748          | 25,9                          | 68   | 1836          | 25,6                          |
| 72   | 1646          | 26,1                          | 72   | 1937          | 25,1                          |
| 76   | 1541          | 26,2                          | 76   | 2035          | 24,5                          |
| 80   | 1436          | 26,2                          | 80   | 2132          | 23,8                          |
| 1'84 | 0'01331       | -26,1                         | 3'84 | 0'02225       | +22,9                         |
| 88   | 1228          | 25,8                          | 88   | 2315          | 21,9                          |
| 92   | 1125          | 25,4                          | 92   | 2400          | 20,9                          |
| 96   | 1025          | 24,9                          | 96   | 2482          | 19,7                          |
| 2'00 | 0'00926       | -24,2                         | 4'00 | 1'02558       | +18,4                         |

Applied Constant: +0'01500.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XVIII

Equations of Longitude

XIX

| G   | Equation | $\Delta$ | G   | Equation | $\Delta$ |
|-----|----------|----------|-----|----------|----------|
| 0   | 0 01 00  | +17 8    | 250 | 0 00403  | -1 8     |
| 5   | 1289     | 17 8     | 255 | 341      | 11 8     |
| 10  | 1378     | 17 6     | 260 | 85       | 10 7     |
| 15  | 1466     | 17 4     | 265 | 35       | 9 5      |
| 20  | 1551     | 17       | 270 | 19       | 8 3      |
| 25  | 1635     | 16 5     | 275 | 152      | 7 1      |
| 30  | 0 01716  | +15 9    | 280 | 0 001 0  | - 5 7    |
| 35  | 1794     | 15 3     | 285 | 94       | 4 4      |
| 40  | 1868     | 14 5     | 290 | 76       | 3 0      |
| 45  | 1939     | 13 6     | 295 | 64       | 1 7      |
| 50  | 20 4     | 1 7      | 300 | 60       | - 0      |
| 55  | 0 02 65  | +11 6    | 305 | 0 0062   | + 1      |
| 60  | 1        | 10 5     | 310 | 71       | 2 5      |
| 65  | 170      | 9 4      | 315 | 87       | 4 0      |
| 70  | 2215     | 8 2      | 320 | 110      | 5 3      |
| 75  | 225      | 6 9      | 325 | 140      | 6 6      |
| 80  | 0 0 284  | + 5 6    | 330 | 0 00176  | + 7 9    |
| 85  | 23 8     | 4 3      | 335 | 219      | 9 1      |
| 90  | 3 6      | 9        | 340 | 267      | 10 3     |
| 95  | 2337     | 1 5      | 345 | 321      | 11 4     |
| 100 | 341      | + 0 1    | 350 | 381      | 12 4     |
| 105 | 0 02339  | - 1 3    | 355 | 0 00445  | +13 4    |
| 110 | 328      | 2 7      | 360 | 514      | 14 3     |
| 115 | 311      | 4 1      | 365 | 588      | 15 1     |
| 120 | 88       | 5 4      | 370 | 665      | 15 8     |
| 125 | 2257     | 6 8      | 375 | 745      | 16 4     |
| 130 | 0 222    | - 8 0    | 380 | 0 008 8  | +16 9    |
| 135 | 177      | 9 3      | 385 | 914      | 17 3     |
| 140 | 2127     | 10 4     | 390 | 1001     | 17 6     |
| 145 | 73       | 11 5     | 395 | 1089     | 17 8     |
| 150 | 013      | 12 6     | 400 | 1179     | 17 9     |
| 155 | 0 01948  | -13 5    | 405 | 0 01 68  | +17 8    |
| 160 | 1878     | 14 4     | 410 | 1357     | 17 7     |
| 165 | 1804     | 15       | 415 | 1446     | 17 4     |
| 170 | 17 6     | 15 9     | 420 | 153      | 17 1     |
| 175 | 1646     | 16 5     | 425 | 1616     | 16 6     |
| 180 | 0 0156   | -16 9    | 430 | 0 01697  | +16 1    |
| 185 | 1476     | 17 3     | 435 | 1776     | 15 4     |
| 190 | 1389     | 17 7     | 440 | 1851     | 14 7     |
| 195 | 130      | 17 8     | 445 | 19 3     | 13 8     |
| 200 | 1211     | 17 9     | 450 | 1990     | 1 9      |
| 205 | 0 011 1  | -17 8    | 455 | 0 0 052  | +11 9    |
| 210 | 103      | 17 7     | 460 | 2108     | 10 8     |
| 215 | 944      | 17 4     | 465 | 160      | 9 7      |
| 220 | 859      | 17 0     | 470 | 205      | 8 5      |
| 225 | 774      | 16 6     | 475 | 2244     | 7        |
| 230 | 0 00693  | -16 0    | 480 | 0 02277  | + 5 9    |
| 235 | 615      | 15 3     | 485 | 2303     | 4 6      |
| 240 | 540      | 14 6     | 490 | 23       | 3 2      |
| 245 | 469      | 13 7     | 495 | 2334     | 1 8      |
| 250 | 0 00403  | -12 8    | 500 | 0 2340   | + 0 4    |

Appl d C tant + 00

| H   | Equation | $\Delta$ | H   | Equation | $\Delta$ |
|-----|----------|----------|-----|----------|----------|
| 0   | 0 00800  | +10 5    | 250 | 0 00581  | -10 1    |
| 5   | 853      | 10 5     | 255 | 531      | 9 9      |
| 10  | 905      | 10 4     | 260 | 483      | 9 6      |
| 15  | 957      | 10 3     | 265 | 435      | 9 3      |
| 20  | 10 8     | 1 1      | 270 | 39       | 8 9      |
| 25  | 1058     | 9 9      | 275 | 347      | 8 5      |
| 30  | 0 01106  | + 9 6    | 280 | 0 00306  | - 8      |
| 35  | 1154     | 9 3      | 285 | 266      | 7 6      |
| 40  | 1199     | 9 0      | 290 | 230      | 7 0      |
| 45  | 1243     | 8 6      | 295 | 196      | 6 5      |
| 50  | 1285     | 8 1      | 300 | 166      | 5 9      |
| 55  | 0 01325  | + 7 7    | 305 | 0 00138  | - 5 3    |
| 60  | 1361     | 7 2      | 310 | 113      | 4 6      |
| 65  | 1396     | 6 6      | 315 | 9        | 4 0      |
| 70  | 1427     | 6 0      | 320 | 74       | 3 3      |
| 75  | 1456     | 5 4      | 325 | 59       | 2 6      |
| 80  | 0 01481  | + 4 8    | 330 | 0 00048  | - 1 9    |
| 85  | 1504     | 4 2      | 335 | 40       | 1 2      |
| 90  | 15       | 3 5      | 340 | 36       | - 0 5    |
| 95  | 1538     | 8        | 345 | 35       | + 0 3    |
| 100 | 1550     | 2 1      | 350 | 38       | 1 0      |
| 105 | 0 01559  | + 1 4    | 355 | 0 00045  | + 1 7    |
| 110 | 1564     | + 7      | 360 | 55       | 2 4      |
| 115 | 1565     | - 0 1    | 365 | 69       | 3 1      |
| 120 | 1563     | 0 8      | 370 | 86       | 3 8      |
| 125 | 1557     | 1 5      | 375 | 106      | 4 5      |
| 130 | 0 01548  | - 2 2    | 380 | 0 00130  | + 5 1    |
| 135 | 1535     | 3 0      | 385 | 157      | 5 7      |
| 140 | 1518     | 3 6      | 390 | 187      | 6 3      |
| 145 | 1499     | 4 3      | 395 | 220      | 6 9      |
| 150 | 1476     | 4 9      | 400 | 256      | 7 4      |
| 155 | 0 01450  | - 5 6    | 405 | 0 00294  | + 7 9    |
| 160 | 1421     | 6 2      | 410 | 334      | 8 3      |
| 165 | 1388     | 6 7      | 415 | 377      | 8 8      |
| 170 | 1353     | 7 3      | 420 | 422      | 9 1      |
| 175 | 1316     | 7 8      | 425 | 468      | 9 5      |
| 180 | 0 01276  | - 8      | 430 | 0 00516  | + 9 8    |
| 185 | 1234     | 8 7      | 435 | 566      | 10 0     |
| 190 | 1189     | 9 0      | 440 | 616      | 10 2     |
| 195 | 1143     | 9 4      | 445 | 668      | 10 4     |
| 200 | 1095     | 9 7      | 450 | 720      | 10 5     |
| 205 | 0 01046  | -10 0    | 455 | 0 00772  | +10 5    |
| 210 | 996      | 10 2     | 460 | 8 5      | 10 5     |
| 215 | 945      | 10 3     | 465 | 878      | 10 5     |
| 220 | 893      | 10 4     | 470 | 929      | 10 3     |
| 225 | 841      | 10 5     | 475 | 980      | 10 2     |
| 230 | 0 00788  | -10 5    | 480 | 0 01031  | +10 0    |
| 235 | 735      | 1 5      | 485 | 1081     | 9 8      |
| 240 | 683      | 10 4     | 490 | 11 9     | 9 5      |
| 245 | 631      | 10 3     | 495 | 1175     | 9 2      |
| 250 | 0 00581  | -1 1     | 500 | 0 01 20  | + 8 8    |

Appl d C t t + 800

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XX

Equations of Longitude

XXI

| 1                        | 2             | 3                 | 4                      | 1                          | 2             | 3                 | 4                      |
|--------------------------|---------------|-------------------|------------------------|----------------------------|---------------|-------------------|------------------------|
| I                        | Equa-<br>tion | $\Delta$<br>$r^d$ | $\frac{1}{2} \Delta^2$ | I                          | Equa-<br>tion | $\Delta$<br>$r^d$ | $\frac{1}{2} \Delta^2$ |
| <sup>d</sup><br><b>0</b> | 0°04500       | -58,0             | ,00                    | <sup>d</sup><br><b>250</b> | 0°05013       | +57,7             | -,05                   |
| <b>5</b>                 | 4210          | 57,9              | +,03                   | <b>255</b>                 | 5300          | 57,1              | ,07                    |
| <b>10</b>                | 3921          | 57,6              | ,05                    | <b>260</b>                 | 5583          | 56,4              | ,09                    |
| <b>15</b>                | 3635          | 57,0              | ,08                    | <b>265</b>                 | 5863          | 55,3              | ,12                    |
| <b>20</b>                | 3352          | 56,1              | ,10                    | <b>270</b>                 | 6136          | 54,0              | ,14                    |
| <b>25</b>                | 3074          | 55,0              | ,13                    | <b>275</b>                 | 6401          | 52,5              | ,16                    |
| <b>30</b>                | 0°02802       | -53,7             | +,15                   | <b>280</b>                 | 0°06659       | +50,8             | -,18                   |
| <b>35</b>                | 2538          | 52,2              | ,17                    | <b>285</b>                 | 6908          | 48,9              | ,21                    |
| <b>40</b>                | 2282          | 50,4              | ,19                    | <b>290</b>                 | 7147          | 46,7              | ,23                    |
| <b>45</b>                | 2036          | 48,4              | ,21                    | <b>295</b>                 | 7375          | 44,4              | ,25                    |
| <b>50</b>                | 1799          | 46,2              | ,23                    | <b>300</b>                 | 7590          | 41,8              | ,26                    |
| <b>55</b>                | 0°01573       | -43,8             | +,25                   | <b>305</b>                 | 0°07792       | +39,2             | -,28                   |
| <b>60</b>                | 1362          | 41,2              | ,27                    | <b>310</b>                 | 7981          | 36,2              | ,30                    |
| <b>65</b>                | 1162          | 38,5              | ,29                    | <b>315</b>                 | 8154          | 33,2              | ,31                    |
| <b>70</b>                | 978           | 35,5              | ,31                    | <b>320</b>                 | 8312          | 30,0              | ,32                    |
| <b>75</b>                | 808           | 32,4              | ,31                    | <b>325</b>                 | 8454          | 26,8              | ,33                    |
| <b>80</b>                | 0°00653       | -29,3             | +,32                   | <b>330</b>                 | 0°08579       | +23,4             | -,35                   |
| <b>85</b>                | 516           | 26,0              | ,34                    | <b>335</b>                 | 8687          | 19,8              | ,36                    |
| <b>90</b>                | 394           | 22,5              | ,35                    | <b>340</b>                 | 8778          | 16,2              | ,36                    |
| <b>95</b>                | 291           | 19,0              | ,36                    | <b>345</b>                 | 8850          | 12,6              | ,37                    |
| <b>100</b>               | 204           | 15,4              | ,37                    | <b>350</b>                 | 8904          | 8,8               | ,38                    |
| <b>105</b>               | 0°00137       | -11,7             | +,37                   | <b>355</b>                 | 0°08938       | +5,1              | -,38                   |
| <b>110</b>               | 88            | 8,0               | ,37                    | <b>360</b>                 | 8954          | +1,3              | ,38                    |
| <b>115</b>               | 58            | 4,3               | ,38                    | <b>365</b>                 | 8950          | -2,5              | ,38                    |
| <b>120</b>               | 45            | -0,4              | ,39                    | <b>370</b>                 | 8929          | 6,2               | ,38                    |
| <b>125</b>               | 53            | +3,4              | ,38                    | <b>375</b>                 | 8888          | 10,0              | ,38                    |
| <b>130</b>               | 0°00079       | +7,1              | +,38                   | <b>380</b>                 | 0°08829       | -13,7             | -,37                   |
| <b>135</b>               | 124           | 10,9              | ,37                    | <b>385</b>                 | 8752          | 17,3              | ,36                    |
| <b>140</b>               | 187           | 14,5              | ,37                    | <b>390</b>                 | 8656          | 20,9              | ,36                    |
| <b>145</b>               | 269           | 18,2              | ,36                    | <b>395</b>                 | 8543          | 24,4              | ,35                    |
| <b>150</b>               | 368           | 21,7              | ,35                    | <b>400</b>                 | 8413          | 27,8              | ,33                    |
| <b>155</b>               | 0°00486       | +25,2             | +,34                   | <b>405</b>                 | 0°08265       | -31,0             | -,32                   |
| <b>160</b>               | 620           | 28,5              | ,33                    | <b>410</b>                 | 8103          | 34,2              | ,31                    |
| <b>165</b>               | 771           | 31,8              | ,32                    | <b>415</b>                 | 7925          | 37,1              | ,29                    |
| <b>170</b>               | 937           | 34,9              | ,30                    | <b>420</b>                 | 7732          | 40,0              | ,28                    |
| <b>175</b>               | 1119          | 37,8              | ,29                    | <b>425</b>                 | 7525          | 42,6              | ,26                    |
| <b>180</b>               | 0°01315       | +40,6             | +,27                   | <b>430</b>                 | 0°07306       | -45,1             | -,24                   |
| <b>185</b>               | 1525          | 43,2              | ,25                    | <b>435</b>                 | 7075          | 47,4              | ,22                    |
| <b>190</b>               | 1746          | 45,6              | ,24                    | <b>440</b>                 | 6833          | 49,5              | ,20                    |
| <b>195</b>               | 1980          | 47,9              | ,22                    | <b>445</b>                 | 6581          | 51,3              | ,18                    |
| <b>200</b>               | 2225          | 49,9              | ,19                    | <b>450</b>                 | 6320          | 53,0              | ,16                    |
| <b>205</b>               | 0°02479       | +51,7             | +,17                   | <b>455</b>                 | 0°06052       | -54,5             | -,13                   |
| <b>210</b>               | 2741          | 53,4              | ,15                    | <b>460</b>                 | 5776          | 55,6              | ,11                    |
| <b>215</b>               | 3011          | 54,7              | ,12                    | <b>465</b>                 | 5495          | 56,6              | ,09                    |
| <b>220</b>               | 3288          | 55,8              | ,10                    | <b>470</b>                 | 5211          | 57,3              | ,06                    |
| <b>225</b>               | 3570          | 56,8              | ,08                    | <b>475</b>                 | 4923          | 57,8              | ,04                    |
| <b>230</b>               | 0°03855       | +57,4             | +,06                   | <b>480</b>                 | 0°04633       | -58,1             | -,01                   |
| <b>235</b>               | 4143          | 57,9              | ,04                    | <b>485</b>                 | 4343          | 58,0              | +,02                   |
| <b>240</b>               | 4433          | 58,1              | +,01                   | <b>490</b>                 | 4053          | 57,8              | ,04                    |
| <b>245</b>               | 4723          | 58,0              | -,02                   | <b>495</b>                 | 3766          | 57,3              | ,07                    |
| <b>250</b>               | 0°05013       | +57,7             | -,05                   | <b>500</b>                 | 0°03482       | -56,5             | +,09                   |

Applied Constant : +0°04500.

| 1                        | 2             | 3                 | 1                          | 2             | 3                 |
|--------------------------|---------------|-------------------|----------------------------|---------------|-------------------|
| J                        | Equa-<br>tion | $\Delta$<br>$r^d$ | J                          | Equa-<br>tion | $\Delta$<br>$r^d$ |
| <sup>d</sup><br><b>0</b> | 0°01800       | -23,3             | <sup>d</sup><br><b>250</b> | 0°01968       | +23,2             |
| <b>5</b>                 | 1684          | 23,2              | <b>255</b>                 | 2083          | 23,0              |
| <b>10</b>                | 1568          | 23,1              | <b>260</b>                 | 2197          | 22,7              |
| <b>15</b>                | 1454          | 22,8              | <b>265</b>                 | 2309          | 22,3              |
| <b>20</b>                | 1340          | 22,5              | <b>270</b>                 | 2420          | 21,8              |
| <b>25</b>                | 1229          | 22,1              | <b>275</b>                 | 2527          | 21,3              |
| <b>30</b>                | 0°01120       | -21,5             | <b>280</b>                 | 0°02632       | +20,6             |
| <b>35</b>                | 1013          | 20,9              | <b>285</b>                 | 2734          | 19,9              |
| <b>40</b>                | 910           | 20,2              | <b>290</b>                 | 2831          | 19,1              |
| <b>45</b>                | 811           | 19,4              | <b>295</b>                 | 2924          | 18,2              |
| <b>50</b>                | 716           | 18,6              | <b>300</b>                 | 3012          | 17,2              |
| <b>55</b>                | 0°00625       | -17,6             | <b>305</b>                 | 0°03095       | +16,1             |
| <b>60</b>                | 540           | 16,6              | <b>310</b>                 | 3173          | 15,0              |
| <b>65</b>                | 460           | 15,5              | <b>315</b>                 | 3246          | 13,8              |
| <b>70</b>                | 385           | 14,4              | <b>320</b>                 | 3312          | 12,6              |
| <b>75</b>                | 316           | 13,2              | <b>325</b>                 | 3371          | 11,3              |
| <b>80</b>                | 0°00254       | -11,9             | <b>330</b>                 | 0°03424       | +10,0             |
| <b>85</b>                | 197           | 10,6              | <b>335</b>                 | 3470          | 8,6               |
| <b>90</b>                | 148           | 9,2               | <b>340</b>                 | 3511          | 7,2               |
| <b>95</b>                | 106           | 7,8               | <b>345</b>                 | 3543          | 5,7               |
| <b>100</b>               | 70            | 6,4               | <b>350</b>                 | 3568          | 4,3               |
| <b>105</b>               | 0°00042       | -4,9              | <b>355</b>                 | 0°03586       | +2,8              |
| <b>110</b>               | 21            | 3,4               | <b>360</b>                 | 3596          | +1,3              |
| <b>115</b>               | 8             | 2,0               | <b>365</b>                 | 3598          | -0,3              |
| <b>120</b>               | 2             | -0,4              | <b>370</b>                 | 3593          | 1,8               |
| <b>125</b>               | 4             | +1,1              | <b>375</b>                 | 3581          | 3,3               |
| <b>130</b>               | 0°00013       | +2,6              | <b>380</b>                 | 0°03561       | -4,7              |
| <b>135</b>               | 30            | 4,1               | <b>385</b>                 | 3534          | 6,2               |
| <b>140</b>               | 54            | 5,6               | <b>390</b>                 | 3499          | 7,6               |
| <b>145</b>               | 85            | 7,0               | <b>395</b>                 | 3457          | 9,0               |
| <b>150</b>               | 124           | 8,4               | <b>400</b>                 | 3409          | 10,4              |
| <b>155</b>               | 0°00170       | +9,8              | <b>405</b>                 | 0°03353       | -11,7             |
| <b>160</b>               | 222           | 11,2              | <b>410</b>                 | 3292          | 13,0              |
| <b>165</b>               | 281           | 12,5              | <b>415</b>                 | 3224          | 14,2              |
| <b>170</b>               | 346           | 13,7              | <b>420</b>                 | 3150          | 15,4              |
| <b>175</b>               | 418           | 14,9              | <b>425</b>                 | 3071          | 16,5              |
| <b>180</b>               | 0°00494       | +16,0             | <b>430</b>                 | 0°02986       | -17,5             |
| <b>185</b>               | 577           | 17,1              | <b>435</b>                 | 2896          | 18,5              |
| <b>190</b>               | 665           | 18,1              | <b>440</b>                 | 2801          | 19,3              |
| <b>195</b>               | 757           | 19,0              | <b>445</b>                 | 2701          | 20,1              |
| <b>200</b>               | 854           | 19,8              | <b>450</b>                 | 2599          | 20,8              |
| <b>205</b>               | 0°00955       | +20,6             | <b>455</b>                 | 0°02494       | -21,5             |
| <b>210</b>               | 1060          | 21,2              | <b>460</b>                 | 2385          | 22,0              |
| <b>215</b>               | 1167          | 21,8              | <b>465</b>                 | 2274          | 22,5              |
| <b>220</b>               | 1277          | 22,3              | <b>470</b>                 | 2161          | 22,8              |
| <b>225</b>               | 1390          | 22,7              | <b>475</b>                 | 2046          | 23,1              |
| <b>230</b>               | 0°01504       | +22,9             | <b>480</b>                 | 0°01930       | -23,2             |
| <b>235</b>               | 1619          | 23,2              | <b>485</b>                 | 1814          | 23,3              |
| <b>240</b>               | 1735          | 23,3              | <b>490</b>                 | 1698          | 23,2              |
| <b>245</b>               | 1852          | 23,3              | <b>495</b>                 | 1582          | 23,1              |
| <b>250</b>               | 0°01968       | +23,2             | <b>500</b>                 | 0°01467       | -22,9             |

Applied Constant : +0°01800.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

| XXII                |          | XXIII |          | XXIV               |          |          | XXV |          | XXVI               |          |
|---------------------|----------|-------|----------|--------------------|----------|----------|-----|----------|--------------------|----------|
| K                   | Equation | L     | Equation | M                  | Equation | $\Delta$ | N   | Equation | O                  | Equation |
| <sup>d</sup><br>000 | 0 00040  | 00    | 0 0003   | <sup>d</sup><br>00 | 0 00 00  | + 35     | 00  | 0 00090  | <sup>d</sup><br>00 | 0 00040  |
| 04                  | 44       | 1     | 5        | 1                  | 35       | 35       | 1   | 105      | 1                  | 46       |
| 08                  | 49       | 2     |          | 2                  | 27       | 34       | 2   | 119      | 2                  | 52       |
| 12                  | 53       | 3     | 16       | 3                  | 30       | 31       | 3   | 13       | 3                  | 57       |
| 16                  | 57       | 4     | 1        | 4                  | 331      | 7        | 4   | 145      | 4                  | 6        |
| 20                  | 6        | 5     | 9        | 5                  | 356      | 22       | 5   | 155      | 5                  | 66       |
| 024                 | 0 00063  | 06    | 0 00006  | 06                 | 0 00375  | + 17     | 06  | 0 00163  | 06                 | 00 70    |
| 28                  | 66       | 7     | 4        | 7                  | 389      | 11       | 7   | 169      | 7                  | 72       |
| 32                  | 68       | 8     | 3        | 8                  | 397      | + 5      | 8   | 172      | 8                  | 74       |
| 36                  | 70       | 9     | 3        | 9                  | 399      | - 2      | 9   | 173      | 9                  | 74       |
| 40                  | 71       | 10    | 4        | 10                 | 394      | 8        | 10  | 171      | 10                 | 74       |
| 044                 | 0 00071  | 11    | 00006    | 11                 | 0 00383  | - 14     | 11  | 0 00166  | 11                 | 0 00072  |
| 48                  | 71       | 2     | 8        | 2                  | 366      | 0        | 2   | 159      | 2                  | 69       |
| 52                  | 70       | 3     | 11       | 3                  | 344      | 5        | 3   | 150      | 3                  | 66       |
| 56                  | 68       | 4     | 15       | 4                  | 317      | 28       | 4   | 139      | 4                  | 62       |
| 60                  | 66       | 5     | 19       | 5                  | 87       | 3        | 5   | 126      | 5                  | 57       |
| 064                 | 0 00064  | 16    | 0 00023  | 16                 | 0 00253  | - 35     | 16  | 0 00112  | 16                 | 0 00051  |
| 68                  | 61       | 7     | 28       | 7                  | 218      | 36       | 7   | 97       | 7                  | 46       |
| 72                  | 57       | 8     | 33       | 8                  | 182      | 36       | 8   | 83       | 8                  | 39       |
| 76                  | 53       | 9     | 37       | 9                  | 147      | 34       | 9   | 68       | 9                  | 33       |
| 80                  | 49       | 20    | 4        | 20                 | 114      | 32       | 20  | 54       | 20                 | 8        |
| 084                 | 0 00045  | 21    | 0 00046  | 21                 | 0 00083  | - 29     | 21  | 0 00041  | 21                 | 0 00023  |
| 88                  | 40       | 2     | 50       | 2                  | 56       | 25       | 2   | 30       | 2                  | 18       |
| 92                  | 36       | 3     | 53       | 3                  | 34       | 20       | 3   | 21       | 3                  | 14       |
| 96                  | 32       | 4     | 55       | 4                  | 17       | 14       | 4   | 14       | 4                  | 10       |
| 100                 | 8        | 5     | 56       | 5                  | 6        | 8        | 5   | 10       | 5                  | 8        |
| 104                 | 0 00024  | 26    | 0 00057  | 26                 | 0 00001  | - 2      | 26  | 0 000 7  | 26                 | 0 0006   |
| 08                  | 20       | 7     | 57       | 7                  | 3        | + 5      | 7   | 8        | 7                  | 6        |
| 12                  | 17       | 8     | 56       | 8                  | 11       | 11       | 8   | 12       | 8                  | 7        |
| 16                  | 14       | 9     | 54       | 9                  | 4        | 17       | 9   | 18       | 9                  | 8        |
| 20                  | 12       | 30    | 51       | 30                 | 44       | 23       | 30  | 25       | 30                 | 11       |
| 124                 | 0 00010  | 31    | 0 00048  | 31                 | 0 00069  | + 7      | 31  | 0 00036  | 31                 | 0 00014  |
| 28                  | 9        | 2     | 44       | 2                  | 98       | 31       | 2   | 47       | 2                  | 19       |
| 32                  | 9        | 3     | 39       | 3                  | 130      | 33       | 3   | 61       | 3                  | 24       |
| 36                  | 9        | 4     | 35       | 4                  | 164      | 35       | 4   | 75       | 4                  | 29       |
| 40                  | 1        | 5     | 30       | 5                  | 00       | 36       | 5   | 90       | 5                  | 35       |
| 144                 | 0 00011  | 36    | 0 00025  | 36                 | 0 00236  | + 35     | 36  | 0 00105  | 36                 | 0 00041  |
| 48                  | 13       | 7     | 20       | 7                  | 7        | 33       | 7   | 119      | 7                  | 47       |
| 52                  | 16       | 8     | 16       | 8                  | 3        | 31       | 8   | 133      | 8                  | 53       |
| 56                  | 19       | 9     | 12       | 9                  | 331      | 27       | 9   | 145      | 9                  | 58       |
| 60                  | 2        | 40    | 9        | 40                 | 356      | 22       | 40  | 155      | 40                 | 63       |
| 164                 | 0 00026  | 41    | 0 00006  | 41                 | 0 00375  | + 17     | 41  | 0 00163  | 41                 | 0 00067  |
| 68                  | 30       | 2     | 4        | 2                  | 389      | 11       | 2   | 169      | 2                  | 70       |
| 72                  | 35       | 3     | 3        | 3                  | 397      | + 5      | 3   | 172      | 3                  | 72       |
| 76                  | 39       | 4     | 3        | 4                  | 399      | - 2      | 4   | 173      | 4                  | 74       |
| 80                  | 43       | 5     | 4        | 5                  | 394      | 8        | 5   | 171      | 5                  | 74       |
| 184                 | 0 00048  | 46    | 0 00006  | 46                 | 0 00383  | - 14     | 46  | 0 00166  | 46                 | 0 00073  |
| 88                  | 52       | 7     | 8        | 7                  | 366      | 0        | 7   | 159      | 7                  | 71       |
| 92                  | 56       | 8     | 11       | 8                  | 344      | 5        | 8   | 150      | 8                  | 68       |
| 96                  | 59       | 9     | 15       | 9                  | 317      | 28       | 9   | 139      | 9                  | 65       |
| 200                 | 0 00063  | 50    | 0 00019  | 50                 | 0 00287  | - 32     | 50  | 0 00126  | 50                 | 0 00061  |

C t t + 0004

C t t + 000

Appl d C t t + 00 00

5

C t t + 0009

C t t + 000

4

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXVII

Equation of Longitude

Argument P

| I      | 2        | 3                | I      | 2        | 3                | I      | 2        | 3                | I      | 2        | 3                | I      | 2        | 3                |
|--------|----------|------------------|--------|----------|------------------|--------|----------|------------------|--------|----------|------------------|--------|----------|------------------|
| P      | Equation | $\Delta$<br>0°·1 | P      | Equation | $\Delta$<br>0°·1 | P      | Equation | $\Delta$<br>0°·1 | P      | Equation | $\Delta$<br>0°·1 | P      | Equation | $\Delta$<br>0°·1 |
| 1850·0 | 0°01505  | +66              | 1860·0 | 0°02852  | +15              | 1870·0 | 0°01310  | -73              | 1880·0 | 0°02354  | -39              | 1890·0 | 0°04885  | 0                |
| ·2     | 1636     | 66               | ·2     | 2887     | 20               | ·2     | 1171     | 66               | ·2     | 2274     | 42               | ·2     | 4877     | -9               |
| ·4     | 1769     | 67               | ·4     | 2932     | 24               | ·4     | 1046     | 59               | ·4     | 2188     | 43               | ·4     | 4850     | 17               |
| ·6     | 1903     | 67               | ·6     | 2982     | 25               | ·6     | 937      | 52               | ·6     | 2101     | 44               | ·6     | 4811     | 23               |
| ·8     | 2037     | 67               | ·8     | 3032     | 27               | ·8     | 838      | 45               | ·8     | 2012     | 44               | ·8     | 4758     | 32               |
| 1851·0 | 0°02172  | +68              | 1861·0 | 0°03088  | +29              | 1871·0 | 0°00757  | -36              | 1881·0 | 0°01927  | -41              | 1891·0 | 0°04683  | -41              |
| ·2     | 2308     | 69               | ·2     | 3146     | 30               | ·2     | 693      | 27               | ·2     | 1847     | 39               | ·2     | 4594     | 50               |
| ·4     | 2446     | 69               | ·4     | 3206     | 32               | ·4     | 646      | 20               | ·4     | 1771     | 36               | ·4     | 4484     | 58               |
| ·6     | 2584     | 69               | ·6     | 3274     | 35               | ·6     | 614      | 13               | ·6     | 1703     | 32               | ·6     | 4364     | 62               |
| ·8     | 2721     | 68               | ·8     | 3346     | 35               | ·8     | 600      | -4               | ·8     | 1643     | 27               | ·8     | 4236     | 68               |
| 1852·0 | 0°02857  | +68              | 1862·0 | 0°03411  | +32              | 1872·0 | 0°00599  | +2               | 1882·0 | 0°01598  | -19              | 1892·0 | 0°04095  | -74              |
| ·2     | 2992     | 67               | ·2     | 3475     | 32               | ·2     | 606      | 7                | ·2     | 1567     | 11               | ·2     | 3943     | 78               |
| ·4     | 3126     | 67               | ·4     | 3537     | 31               | ·4     | 628      | 13               | ·4     | 1554     | -4               | ·4     | 3784     | 80               |
| ·6     | 3259     | 66               | ·6     | 3597     | 30               | ·6     | 656      | 16               | ·6     | 1551     | +1               | ·6     | 3625     | 81               |
| ·8     | 3389     | 63               | ·8     | 3656     | 29               | ·8     | 691      | 21               | ·8     | 1557     | 8                | ·8     | 3462     | 82               |
| 1853·0 | 0°03513  | +61              | 1863·0 | 0°03712  | +28              | 1873·0 | 0°00738  | +25              | 1883·0 | 0°01583  | +17              | 1893·0 | 0°03299  | -80              |
| ·2     | 3632     | 57               | ·2     | 3767     | 27               | ·2     | 791      | 28               | ·2     | 1624     | 24               | ·2     | 3142     | 77               |
| ·4     | 3741     | 53               | ·4     | 3820     | 27               | ·4     | 849      | 30               | ·4     | 1680     | 31               | ·4     | 2990     | 75               |
| ·6     | 3843     | 50               | ·6     | 3872     | 25               | ·6     | 909      | 31               | ·6     | 1746     | 36               | ·6     | 2842     | 72               |
| ·8     | 3939     | 45               | ·8     | 3920     | 24               | ·8     | 974      | 34               | ·8     | 1820     | 41               | ·8     | 2703     | 66               |
| 1854·0 | 0°04021  | +38              | 1864·0 | 0°03969  | +24              | 1874·0 | 0°01044  | +36              | 1884·0 | 0°01910  | +47              | 1894·0 | 0°02580  | -59              |
| ·2     | 4090     | 31               | ·2     | 4015     | 21               | ·2     | 1116     | 37               | ·2     | 2007     | 51               | ·2     | 2469     | 53               |
| ·4     | 4144     | 24               | ·4     | 4052     | 17               | ·4     | 1193     | 38               | ·4     | 2113     | 55               | ·4     | 2370     | 47               |
| ·6     | 4184     | 18               | ·6     | 4085     | 16               | ·6     | 1269     | 39               | ·6     | 2228     | 58               | ·6     | 2280     | 44               |
| ·8     | 4214     | 11               | ·8     | 4115     | 13               | ·8     | 1350     | 41               | ·8     | 2344     | 59               | ·8     | 2198     | 36               |
| 1855·0 | 0°04227  | +2               | 1865·0 | 0°04137  | +10              | 1875·0 | 0°01431  | +41              | 1885·0 | 0°02464  | +61              | 1895·0 | 0°02135  | -28              |
| ·2     | 4223     | -6               | ·2     | 4153     | +5               | ·2     | 1513     | 42               | ·2     | 2586     | 62               | ·2     | 2084     | 20               |
| ·4     | 4202     | 15               | ·4     | 4156     | 0                | ·4     | 1597     | 43               | ·4     | 2713     | 63               | ·4     | 2051     | 15               |
| ·6     | 4166     | 21               | ·6     | 4153     | -2               | ·6     | 1683     | 44               | ·6     | 2838     | 63               | ·6     | 2026     | 12               |
| ·8     | 4118     | 28               | ·8     | 4143     | 10               | ·8     | 1773     | 45               | ·8     | 2963     | 63               | ·8     | 2008     | 6                |
| 1856·0 | 0°04055  | -34              | 1866·0 | 0°04116  | -16              | 1876·0 | 0°01865  | +46              | 1886·0 | 0°03090  | +63              | 1896·0 | 0°02002  | -2               |
| ·2     | 3982     | 40               | ·2     | 4075     | 25               | ·2     | 1954     | 45               | ·2     | 3215     | 63               | ·2     | 2002     | +1               |
| ·4     | 3895     | 45               | ·4     | 4017     | 32               | ·4     | 2042     | 44               | ·4     | 3340     | 62               | ·4     | 2008     | 6                |
| ·6     | 3802     | 47               | ·6     | 3950     | 37               | ·6     | 2130     | 43               | ·6     | 3462     | 61               | ·6     | 2024     | 10               |
| ·8     | 3706     | 49               | ·8     | 3870     | 45               | ·8     | 2215     | 42               | ·8     | 3583     | 60               | ·8     | 2044     | 10               |
| 1857·0 | 0°03606  | -51              | 1867·0 | 0°03773  | -52              | 1877·0 | 0°02296  | +39              | 1887·0 | 0°03703  | +59              | 1897·0 | 0°02066  | +11              |
| ·2     | 3502     | 52               | ·2     | 3662     | 61               | ·2     | 2369     | 35               | ·2     | 3819     | 57               | ·2     | 2089     | 13               |
| ·4     | 3398     | 51               | ·4     | 3529     | 69               | ·4     | 2436     | 32               | ·4     | 3932     | 56               | ·4     | 2116     | 15               |
| ·6     | 3300     | 49               | ·6     | 3388     | 73               | ·6     | 2498     | 29               | ·6     | 4044     | 55               | ·6     | 2147     | 15               |
| ·8     | 3203     | 46               | ·8     | 3238     | 79               | ·8     | 2552     | 24               | ·8     | 4152     | 54               | ·8     | 2175     | 14               |
| 1858·0 | 0°03117  | -41              | 1868·0 | 0°03075  | -84              | 1878·0 | 0°02595  | +20              | 1888·0 | 0°04259  | +52              | 1898·0 | 0°02204  | +15              |
| ·2     | 3045     | 33               | ·2     | 2903     | 88               | ·2     | 2625     | 12               | ·2     | 4362     | 50               | ·2     | 2235     | 16               |
| ·4     | 2985     | 29               | ·4     | 2721     | 91               | ·4     | 2641     | 5                | ·4     | 4458     | 46               | ·4     | 2266     | 16               |
| ·6     | 2926     | 29               | ·6     | 2538     | 93               | ·6     | 2648     | +2               | ·6     | 4546     | 43               | ·6     | 2298     | 16               |
| ·8     | 2871     | 25               | ·8     | 2349     | 94               | ·8     | 2647     | -5               | ·8     | 4630     | 39               | ·8     | 2328     | 15               |
| 1859·0 | 0°02835  | -14              | 1869·0 | 0°02161  | -93              | 1879·0 | 0°02628  | -13              | 1889·0 | 0°04702  | +34              | 1899·0 | 0°02360  | +15              |
| ·2     | 2814     | 8                | ·2     | 1978     | 91               | ·2     | 2595     | 20               | ·2     | 4764     | 28               | ·2     | 2390     | 16               |
| ·4     | 2803     | -1               | ·4     | 1799     | 88               | ·4     | 2547     | 25               | ·4     | 4816     | 23               | ·4     | 2422     | 16               |
| ·6     | 2809     | +6               | ·6     | 1626     | 84               | ·6     | 2494     | 29               | ·6     | 4857     | 16               | ·6     | 2452     | 15               |
| ·8     | 2827     | 11               | ·8     | 1462     | 79               | ·8     | 2430     | 35               | ·8     | 4878     | +7               | ·8     | 2483     | 15               |
| 1860·0 | 0°02852  | +15              | 1870·0 | 0°01310  | -73              | 1880·0 | 0°02354  | -39              | 1890·0 | 0°04885  | 0                | 1900·0 | 0°02512  | +14              |

Applied Constant: +0°02600.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXVII continued

Equation of Longitude

Argument P

| P      | Equation | $\Delta$<br>o | P      | Equation | $\Delta$<br>o | P      | Equation | $\Delta$ | P      | Equation | $\Delta$<br>o | P      | Equation | $\Delta$<br>o | P      | Equation | $\Delta$<br>o |
|--------|----------|---------------|--------|----------|---------------|--------|----------|----------|--------|----------|---------------|--------|----------|---------------|--------|----------|---------------|
| 1900 0 | 0251     | +14           | 1910 0 | 001455   | +64           | 1920 0 | 002801   | +3       | 1930 0 | 000816   | -51           | 1940 0 | 001546   | -46           | 1950 0 | 004575   | -21           |
| 2      | 2539     | 13            | 2      | 1584     | 65            | 2      | 769      | 35       | 2      | 72       | 4             | 2      | 1454     | 45            | 2      | 1900     | 40            |
| 4      | 56       | 10            | 4      | 1714     | 65            | 4      | 284      | 37       | 4      | 649      | 34            | 4      | 1365     | 43            | 4      | 1818     | 42            |
| 6      | 579      | 8             | 6      | 1845     | 66            | 6      | 2917     | 38       | 6      | 586      | 8             | 6      | 1819     | 45            | 6      | 1730     | 45            |
| 8      | 594      | 6             | 8      | 1978     | 66            | 8      | 992      | 37       | 8      | 536      | 1             | 8      | 1808     | 46            | 8      | 1639     | 46            |
| 1901 0 | 0064     | +             | 1911 0 | 002110   | +67           | 1921 0 | 003065   | +38      | 1931 0 | 0005     | -13           | 1941 0 | 001138   | -30           | 1951 0 | 004579   | +19           |
| 2      | 2604     | -             | 2      | 45       | 67            | 2      | 3141     | 37       | 2      | 486      | 6             | 2      | 184      | 3             | 2      | 1900     | 40            |
| 4      | 596      | 6             | 4      | 2376     | 66            | 4      | 3216     | 36       | 4      | 479      | -1            | 4      | 1046     | 16            | 4      | 1820     | +2            |
| 6      | 2579     | 11            | 6      | 509      | 66            | 6      | 3287     | 36       | 6      | 483      | +4            | 6      | 1019     | 11            | 6      | 1730     | 45            |
| 8      | 55       | 18            | 8      | 640      | 65            | 8      | 3359     | 35       | 8      | 495      | 9             | 8      | 1002     | -5            | 8      | 1608     | 11            |
| 1902 0 | 00507    | 5             | 1912 0 | 002768   | +63           | 1922 0 | 03430    | +35      | 1932 0 | 000519   | +14           | 1942 0 | 001001   | +4            | 1952 0 | 004575   | -21           |
| 2      | 45       | 30            | 2      | 893      | 61            | 2      | 3500     | 34       | 2      | 55       | 19            | 2      | 1018     | 13            | 2      | 1900     | 40            |
| 4      | 387      | 35            | 4      | 3013     | 59            | 4      | 3564     | 3        | 4      | 593      | 21            | 4      | 1052     | 20            | 4      | 1820     | +2            |
| 6      | 2311     | 43            | 6      | 317      | 56            | 6      | 369      | 3        | 6      | 639      | 24            | 6      | 1099     | 6             | 6      | 1730     | 45            |
| 8      | 17       | 5             | 8      | 338      | 53            | 8      | 3690     | 30       | 8      | 689      | 26            | 8      | 1156     | 32            | 8      | 1608     | 11            |
| 1903 0 | 0112     | 55            | 1913 0 | 003339   | +48           | 1923 0 | 003747   | +29      | 1933 0 | 000743   | +8            | 1943 0 | 001230   | +40           | 1953 0 | 004575   | -21           |
| 2      | 1998     | 61            | 2      | 3430     | 41            | 2      | 3807     | 8        | 2      | 801      | 30            | 2      | 1316     | 46            | 2      | 1900     | 40            |
| 4      | 1869     | 65            | 4      | 3503     | 35            | 4      | 3860     | 25       | 4      | 862      | 31            | 4      | 1415     | 50            | 4      | 1820     | +2            |
| 6      | 1738     | 68            | 6      | 3569     | 31            | 6      | 3908     | 3        | 6      | 94       | 31            | 6      | 1517     | 53            | 6      | 1730     | 45            |
| 8      | 1599     | 7             | 8      | 3626     | 24            | 8      | 3952     | 1        | 8      | 986      | 33            | 8      | 1627     | 57            | 8      | 1608     | 11            |
| 1904 0 | 001451   | -73           | 1914 0 | 003664   | +15           | 1924 0 | 003992   | +18      | 1934 0 | 001055   | +35           | 1944 0 | 001745   | +61           | 1954 0 | 004575   | -21           |
| 2      | 135      | 74            | 2      | 3686     | +6            | 2      | 425      | 15       | 2      | 117      | 36            | 2      | 1869     | 63            | 2      | 1900     | 40            |
| 4      | 1154     | 75            | 4      | 3689     | 1             | 4      | 4051     | 11       | 4      | 100      | 37            | 4      | 1998     | 65            | 4      | 1820     | +2            |
| 6      | 105      | 73            | 6      | 368      | 5             | 6      | 4070     | 8        | 6      | 174      | 37            | 6      | 2130     | 65            | 6      | 1730     | 45            |
| 8      | 861      | 7             | 8      | 3665     | 13            | 8      | 4081     | +        | 8      | 1349     | 38            | 8      | 2259     | 66            | 8      | 1608     | 11            |
| 1905 0 | 00726    | -66           | 1915 0 | 003630   | -21           | 1925 0 | 004078   | -4       | 1935 0 | 001424   | +38           | 1945 0 | 02393    | +67           | 1955 0 | 004575   | -21           |
| 2      | 599      | 61            | 2      | 3582     | 9             | 2      | 4065     | 11       | 2      | 1501     | 39            | 2      | 2526     | 66            | 2      | 1900     | 40            |
| 4      | 483      | 55            | 4      | 3516     | 34            | 4      | 4034     | 18       | 4      | 1578     | 39            | 4      | 658      | 66            | 4      | 1820     | +2            |
| 6      | 379      | 50            | 6      | 3447     | 37            | 6      | 399      | 23       | 6      | 1656     | 39            | 6      | 790      | 67            | 6      | 1730     | 45            |
| 8      | 84       | 4             | 8      | 3367     | 43            | 8      | 3938     | 31       | 8      | 1733     | 38            | 8      | 2925     | 66            | 8      | 1608     | 11            |
| 1906 0 | 00010    | -34           | 1916 0 | 003275   | -48           | 1926 0 | 003871   | -39      | 1936 0 | 001807   | +37           | 1946 0 | 003054   | +65           | 1956 0 | 004575   | -21           |
| 2      | 150      | 25            | 2      | 3180     | 48            | 2      | 3786     | 49       | 2      | 1879     | 36            | 2      | 3184     | 64            | 2      | 1900     | 40            |
| 4      | 112      | 16            | 4      | 3084     | 48            | 4      | 3679     | 56       | 4      | 1950     | 34            | 4      | 3309     | 63            | 4      | 1820     | +2            |
| 6      | 87       | -9            | 6      | 990      | 47            | 6      | 3561     | 61       | 6      | 2015     | 31            | 6      | 3437     | 64            | 6      | 1730     | 45            |
| 8      | 77       | 0             | 8      | 2897     | 46            | 8      | 3433     | 68       | 8      | 073      | 27            | 8      | 3563     | 62            | 8      | 1608     | 11            |
| 1907 0 | 00086    | +7            | 1917 0 | 00807    | -43           | 1927 0 | 003289   | -75      | 1937 0 | 002122   | +21           | 1947 0 | 003684   | +60           | 1957 0 | 004575   | -21           |
| 2      | 106      | 15            | 2      | 272      | 40            | 2      | 3133     | 80       | 2      | 2158     | 16            | 2      | 382      | 58            | 2      | 1900     | 40            |
| 4      | 146      | 24            | 4      | 2648     | 35            | 4      | 968      | 86       | 4      | 2184     | 11            | 4      | 3916     | 56            | 4      | 1820     | +2            |
| 6      | 200      | 9             | 6      | 582      | 31            | 6      | 790      | 92       | 6      | 200      | +7            | 6      | 4026     | 54            | 6      | 1730     | 45            |
| 8      | 26       | 34            | 8      | 56       | 5             | 8      | 2607     | 93       | 8      | 210      | 0             | 8      | 4133     | 52            | 8      | 1608     | 11            |
| 1908 0 | 000337   | +41           | 1918 0 | 002483   | 18            | 1928 0 | 00240    | -95      | 1938 0 | 002201   | -7            | 1948 0 | 004232   | +47           | 1958 0 | 004575   | -21           |
| 2      | 45       | 46            | 2      | 454      | 11            | 2      | 229      | 95       | 2      | 2181     | 14            | 2      | 4321     | 41            | 2      | 1900     | 40            |
| 4      | 50       | 49            | 4      | 441      | -4            | 4      | 041      | 94       | 4      | 2146     | 20            | 4      | 4397     | 36            | 4      | 1820     | +2            |
| 6      | 60       | 52            | 6      | 437      | 0             | 6      | 1855     | 9        | 6      | 2101     | 26            | 6      | 4466     | 34            | 6      | 1730     | 45            |
| 8      | 77       | 55            | 8      | 443      | +7            | 8      | 1673     | 89       | 8      | 04       | 31            | 8      | 4530     | 28            | 8      | 1608     | 11            |
| 1909 0 | 00840    | +58           | 1919 0 | 002463   | +13           | 1929 0 | 00151    | -84      | 1939 0 | 001978   | -36           | 1949 0 | 004579   | +19           | 1959 0 | 004575   | -21           |
| 2      | 959      | 6             | 2      | 493      | 18            | 2      | 1339     | 77       | 2      | 1900     | 40            | 2      | 4610     | 10            | 2      | 1900     | 40            |
| 4      | 178      | 61            | 4      | 2535     | 23            | 4      | 1192     | 71       | 4      | 1818     | 42            | 4      | 4620     | +2            | 4      | 1820     | +2            |
| 6      | 101      | 6             | 6      | 583      | 26            | 6      | 105      | 67       | 6      | 1730     | 45            | 6      | 4619     | -3            | 6      | 1730     | 45            |
| 8      | 136      | 63            | 8      | 639      | 9             | 8      | 924      | 59       | 8      | 1639     | 46            | 8      | 4608     | 11            | 8      | 1608     | 11            |
| 1910 0 | 001455   | +64           | 1920 0 | 002801   | +3            | 1930 0 | 000816   | -51      | 1940 0 | 001546   | -46           | 1950 0 | 004575   | -21           |        |          |               |

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXVII continued

Equation of Longitude

Argument P

| 1      | 2        | 3                     | 1      | 2        | 3                     | 1      | 2        | 3                     | 1      | 2        | 3                     | 1      | 2        | 3                     |
|--------|----------|-----------------------|--------|----------|-----------------------|--------|----------|-----------------------|--------|----------|-----------------------|--------|----------|-----------------------|
| P      | Equation | $\Delta_{0^{\circ}1}$ | P      | Equation | $\Delta_{0^{\circ}1}$ | P      | Equation | $\Delta_{0^{\circ}1}$ | P      | Equation | $\Delta_{0^{\circ}1}$ | P      | Equation | $\Delta_{0^{\circ}1}$ |
| 1950.0 | 0.04575  | -21                   | 1960.0 | 0.02849  | +8                    | 1970.0 | 0.01941  | +65                   | 1980.0 | 0.03232  | +43                   | 1990.0 | 0.01183  | -25                   |
| .2     | 4524     | 29                    | .2     | 2862     | +5                    | .2     | 2070     | 65                    | .2     | 3320     | 44                    | .2     | 1140     | 17                    |
| .4     | 4458     | 38                    | .4     | 2867     | 0                     | .4     | 2199     | 66                    | .4     | 3409     | 44                    | .4     | 1114     | 10                    |
| .6     | 4374     | 44                    | .6     | 2862     | -4                    | .6     | 2332     | 66                    | .6     | 3496     | 43                    | .6     | 1099     | -6                    |
| .8     | 4279     | 52                    | .8     | 2851     | 9                     | .8     | 2462     | 64                    | .8     | 3581     | 42                    | .8     | 1092     | 0                     |
| 1951.0 | 0.04167  | -59                   | 1961.0 | 0.02826  | -16                   | 1971.0 | 0.02589  | +64                   | 1981.0 | 0.03665  | +42                   | 1991.0 | 0.01099  | +6                    |
| .2     | 4046     | 63                    | .2     | 2789     | 22                    | .2     | 2718     | 64                    | .2     | 3749     | 41                    | .2     | 1114     | 11                    |
| .4     | 3914     | 68                    | .4     | 2739     | 27                    | .4     | 2843     | 62                    | .4     | 3828     | 39                    | .4     | 1142     | 15                    |
| .6     | 3775     | 71                    | .6     | 2681     | 33                    | .6     | 2965     | 61                    | .6     | 3905     | 39                    | .6     | 1174     | 17                    |
| .8     | 3631     | 73                    | .8     | 2607     | 40                    | .8     | 3087     | 58                    | .8     | 3982     | 38                    | .8     | 1210     | 19                    |
| 1952.0 | 0.03483  | -74                   | 1962.0 | 0.02520  | -47                   | 1972.0 | 0.03197  | +53                   | 1982.0 | 0.04058  | +37                   | 1992.0 | 0.01250  | +23                   |
| .2     | 3335     | 74                    | .2     | 2418     | 55                    | .2     | 3301     | 50                    | .2     | 4129     | 35                    | .2     | 1301     | 26                    |
| .4     | 3188     | 72                    | .4     | 2299     | 61                    | .4     | 3397     | 45                    | .4     | 4197     | 33                    | .4     | 1355     | 26                    |
| .6     | 3047     | 70                    | .6     | 2176     | 63                    | .6     | 3482     | 41                    | .6     | 4262     | 32                    | .6     | 1406     | 26                    |
| .8     | 2908     | 67                    | .8     | 2049     | 67                    | .8     | 3559     | 35                    | .8     | 4324     | 30                    | .8     | 1462     | 28                    |
| 1953.0 | 0.02778  | -62                   | 1963.0 | 0.01908  | -73                   | 1973.0 | 0.03621  | +27                   | 1983.0 | 0.04383  | +28                   | 1993.0 | 0.01518  | +30                   |
| .2     | 2662     | 56                    | .2     | 1759     | 75                    | .2     | 3669     | 19                    | .2     | 4436     | 25                    | .2     | 1582     | 32                    |
| .4     | 2554     | 51                    | .4     | 1607     | 76                    | .4     | 3697     | 12                    | .4     | 4482     | 22                    | .4     | 1645     | 32                    |
| .6     | 2459     | 45                    | .6     | 1455     | 77                    | .6     | 3717     | 7                     | .6     | 4522     | 19                    | .6     | 1709     | 32                    |
| .8     | 2373     | 40                    | .8     | 1299     | 76                    | .8     | 3725     | +1                    | .8     | 4556     | 14                    | .8     | 1774     | 33                    |
| 1954.0 | 0.02302  | -34                   | 1964.0 | 0.01148  | -74                   | 1974.0 | 0.03720  | -9                    | 1984.0 | 0.04579  | +9                    | 1994.0 | 0.01840  | +35                   |
| .2     | 2241     | 25                    | .2     | 1001     | 71                    | .2     | 3692     | 17                    | .2     | 4593     | +3                    | .2     | 1915     | 37                    |
| .4     | 2200     | 18                    | .4     | 863      | 67                    | .4     | 3652     | 22                    | .4     | 4591     | -3                    | .4     | 1986     | 36                    |
| .6     | 2170     | 14                    | .6     | 735      | 62                    | .6     | 3604     | 27                    | .6     | 4580     | 10                    | .6     | 2057     | 35                    |
| .8     | 2148     | 9                     | .8     | 614      | 56                    | .8     | 3546     | 33                    | .8     | 4553     | 16                    | .8     | 2125     | 35                    |
| 1955.0 | 0.02135  | -5                    | 1965.0 | 0.00511  | -49                   | 1975.0 | 0.03474  | -38                   | 1985.0 | 0.04516  | -23                   | 1995.0 | 0.02197  | +36                   |
| .2     | 2130     | -1                    | .2     | 420      | 41                    | .2     | 3396     | 41                    | .2     | 4461     | 33                    | .2     | 2268     | 34                    |
| .4     | 2132     | +4                    | .4     | 348      | 33                    | .4     | 3309     | 44                    | .4     | 4386     | 40                    | .4     | 2333     | 32                    |
| .6     | 2146     | 10                    | .6     | 290      | 26                    | .6     | 3222     | 44                    | .6     | 4300     | 46                    | .6     | 2396     | 31                    |
| .8     | 2171     | 14                    | .8     | 246      | 17                    | .8     | 3133     | 45                    | .8     | 4202     | 54                    | .8     | 2456     | 28                    |
| 1956.0 | 0.02200  | +14                   | 1966.0 | 0.00222  | -8                    | 1976.0 | 0.03044  | -43                   | 1986.0 | 0.04086  | -62                   | 1996.0 | 0.02508  | +24                   |
| .2     | 2228     | 15                    | .2     | 213      | +1                    | .2     | 2961     | 40                    | .2     | 3955     | 70                    | .2     | 2553     | 20                    |
| .4     | 2260     | 17                    | .4     | 226      | 9                     | .4     | 2884     | 37                    | .4     | 3807     | 76                    | .4     | 2589     | 15                    |
| .6     | 2294     | 17                    | .6     | 249      | 15                    | .6     | 2812     | 34                    | .6     | 3651     | 80                    | .6     | 2613     | 11                    |
| .8     | 2328     | 18                    | .8     | 284      | 21                    | .8     | 2748     | 29                    | .8     | 3487     | 85                    | .8     | 2633     | +6                    |
| 1957.0 | 0.02365  | +18                   | 1967.0 | 0.00335  | +28                   | 1977.0 | 0.02696  | -24                   | 1987.0 | 0.03314  | -89                   | 1997.0 | 0.02638  | -1                    |
| .2     | 2399     | 18                    | .2     | 396      | 35                    | .2     | 2652     | 18                    | .2     | 3133     | 92                    | .2     | 2630     | 8                     |
| .4     | 2436     | 18                    | .4     | 473      | 40                    | .4     | 2626     | 10                    | .4     | 2948     | 92                    | .4     | 2606     | 15                    |
| .6     | 2473     | 19                    | .6     | 556      | 43                    | .6     | 2612     | -5                    | .6     | 2765     | 92                    | .6     | 2573     | 19                    |
| .8     | 2510     | 18                    | .8     | 646      | 48                    | .8     | 2606     | +1                    | .8     | 2581     | 91                    | .8     | 2532     | 25                    |
| 1958.0 | 0.02545  | +17                   | 1968.0 | 0.00747  | +51                   | 1978.0 | 0.02618  | +8                    | 1988.0 | 0.02400  | -90                   | 1998.0 | 0.02474  | -32                   |
| .2     | 2578     | 17                    | .2     | 851      | 54                    | .2     | 2641     | 16                    | .2     | 2223     | 86                    | .2     | 2406     | 37                    |
| .4     | 2614     | 18                    | .4     | 962      | 56                    | .4     | 2680     | 21                    | .4     | 2058     | 80                    | .4     | 2326     | 41                    |
| .6     | 2651     | 18                    | .6     | 1076     | 58                    | .6     | 2724     | 24                    | .6     | 1902     | 76                    | .6     | 2242     | 44                    |
| .8     | 2686     | 17                    | .8     | 1194     | 59                    | .8     | 2777     | 29                    | .8     | 1753     | 71                    | .8     | 2150     | 46                    |
| 1959.0 | 0.02721  | +16                   | 1969.0 | 0.01314  | +61                   | 1979.0 | 0.02839  | +32                   | 1989.0 | 0.01621  | -62                   | 1999.0 | 0.02058  | -48                   |
| .2     | 2752     | 15                    | .2     | 1437     | 61                    | .2     | 2906     | 36                    | .2     | 1505     | 54                    | .2     | 1958     | 49                    |
| .4     | 2781     | 15                    | .4     | 1558     | 62                    | .4     | 2982     | 39                    | .4     | 1406     | 47                    | .4     | 1863     | 47                    |
| .6     | 2810     | 13                    | .6     | 1683     | 64                    | .6     | 3062     | 41                    | .6     | 1318     | 41                    | .6     | 1771     | 47                    |
| .8     | 2832     | 10                    | .8     | 1812     | 65                    | .8     | 3147     | 43                    | .8     | 1241     | 34                    | .8     | 1677     | 46                    |
| 1960.0 | 0.02849  | +8                    | 1970.0 | 0.01941  | +65                   | 1980.0 | 0.03232  | +43                   | 1990.0 | 0.01183  | -25                   | 2000.0 | 0.01589  | -44                   |

Applied Constant:  $+0^{\circ}02600$ .



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXVIII

Equation of Longitude

Argument Q

| Q   | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q   | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q   | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q   | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ |
|-----|----------|----------|-----------------------|-----|----------|----------|-----------------------|-----|----------|----------|-----------------------|-----|----------|----------|-----------------------|
| 000 | 004400   | -147     | 0                     | 050 | 00323    | +29      | +                     | 100 | 0068     | +136     | -1                    | 150 | 007843   | -83      | -3                    |
| 01  | 4253     | 147      | 0                     | 51  | 354      | 34       | 3                     | 01  | 6143     | 134      | 2                     | 51  | 7758     | 87       | 2                     |
| 02  | 4106     | 147      | 0                     | 52  | 391      | 4        | 3                     | 02  | 675      | 132      | 1                     | 52  | 7669     | 91       |                       |
| 03  | 3959     | 147      | 0                     | 53  | 433      | 44       |                       | 03  | 6406     | 129      |                       | 53  | 7576     | 95       | 2                     |
| 04  | 3813     | 146      | 0                     | 54  | 479      | 49       | 3                     | 04  | 6533     | 126      | 1                     | 54  | 7479     | 99       |                       |
| 05  | 3668     | 145      | 0                     | 55  | 531      | 54       | 2                     | 05  | 6658     | 124      | 2                     | 55  | 7378     | 103      |                       |
| 006 | 003524   | -144     | 0                     | 056 | 00587    | +59      | +3                    | 106 | 006780   | +121     | -1                    | 156 | 007274   | -106     | -                     |
| 07  | 3380     | 143      | +1                    | 57  | 648      | 64       | 3                     | 07  | 6900     | 118      | 2                     | 57  | 7166     | 110      | 2                     |
| 08  | 3238     | 141      | 1                     | 58  | 714      | 69       | 3                     | 08  | 7016     | 115      | 2                     | 58  | 7054     | 114      | 2                     |
| 09  | 3098     | 140      | 1                     | 59  | 785      | 73       | 2                     | 09  | 7129     | 111      | 2                     | 59  | 6939     | 117      | 2                     |
| 10  | 2959     | 138      | 1                     | 60  | 860      | 77       |                       | 10  | 7238     | 108      |                       | 60  | 6821     | 120      |                       |
| 011 | 28       | -136     | +1                    | 061 | 00939    | +82      | +3                    | 111 | 007344   | +104     | -2                    | 161 | 006700   | -123     | -2                    |
| 12  | 687      | 134      | 1                     | 62  | 103      | 86       |                       | 12  | 7446     | 100      | 2                     | 62  | 6576     | 126      | 2                     |
| 13  | 554      | 13       | 1                     | 63  | 1111     | 90       |                       | 13  | 7544     | 96       |                       | 63  | 6449     | 128      | 1                     |
| 14  | 43       | 130      | 2                     | 64  | 103      | 94       |                       | 14  | 7638     | 93       | 2                     | 64  | 6320     | 131      | 2                     |
| 15  | 295      | 127      | 1                     | 65  | 199      | 98       |                       | 15  | 7729     | 89       | 3                     | 65  | 6188     | 133      | 1                     |
| 016 | 002169   | -15      | +                     | 066 | 001399   | +102     | +2                    | 116 | 007815   | +84      | -2                    | 166 | 006054   | -135     | -1                    |
| 17  | 046      | 12       |                       | 67  | 1503     | 106      | 2                     | 17  | 7897     | 80       | 3                     | 67  | 5918     | 137      | 1                     |
| 18  | 196      | 118      | 2                     | 68  | 1610     | 109      | 2                     | 18  | 7974     | 75       | 2                     | 68  | 5780     | 139      | 1                     |
| 19  | 1810     | 115      | 1                     | 69  | 1721     | 113      | 2                     | 19  | 8047     | 71       | 2                     | 69  | 5640     | 141      | 1                     |
| 20  | 1696     | 11       |                       | 70  | 1835     | 116      | 2                     | 20  | 8116     | 66       | 3                     | 70  | 5499     | 142      | 1                     |
| 021 | 1586     | -109     | +                     | 071 | 001953   | +119     | +1                    | 121 | 08179    | +61      | -2                    | 171 | 005357   | -143     | -1                    |
| 22  | 1479     | 105      | 3                     | 72  | 073      | 122      | 2                     | 22  | 8238     | 57       | 2                     | 72  | 5213     | 145      | 1                     |
| 23  | 1377     | 101      | 1                     | 73  | 2197     | 125      | 1                     | 23  | 8293     | 52       | 3                     | 73  | 5068     | 146      | 1                     |
| 24  | 1277     | 98       | 3                     | 74  | 233      | 128      |                       | 24  | 8342     | 48       | 3                     | 74  | 4922     | 146      | 0                     |
| 25  | 1182     | 93       |                       | 75  | 2452     | 130      | 1                     | 25  | 8386     | 4        | 3                     | 75  | 4776     | 147      | -1                    |
| 026 | 001091   | -89      | +2                    | 076 | 00583    | +13      | +1                    | 126 | 008426   | +37      | -3                    | 176 | 004629   | -147     | 0                     |
| 27  | 1004     | 85       | 2                     | 77  | 2716     | 135      | 2                     | 27  | 8460     | 3        | 2                     | 77  | 448      | 147      | 0                     |
| 28  | 91       | 81       | 3                     | 78  | 852      | 137      | 1                     | 28  | 8490     | 27       | 3                     | 78  | 4335     | 147      | 0                     |
| 29  | 843      | 76       | 2                     | 79  | 2989     | 139      |                       | 29  | 8514     | 21       | 4                     | 79  | 4188     | 147      | 0                     |
| 30  | 769      | 7        | 2                     | 80  | 3129     | 141      | 1                     | 30  | 8533     | 16       | 2                     | 80  | 4041     | 147      | +1                    |
| 031 | 000699   | -68      | +3                    | 081 | 03270    | +142     | +1                    | 131 | 008547   | +12      | -3                    | 181 | 003895   | -146     | 0                     |
| 32  | 634      | 63       | 3                     | 82  | 341      | 143      | 1                     | 32  | 8556     | 6        | 3                     | 82  | 3749     | 146      | +1                    |
| 33  | 574      | 58       | 3                     | 83  | 3555     | 144      | +1                    | 33  | 8559     | +1       | 3                     | 83  | 3604     | 145      | 1                     |
| 34  | 519      | 53       | 2                     | 84  | 3700     | 145      | 0                     | 34  | 8557     | -5       | 3                     | 84  | 3460     | 143      | +1                    |
| 35  | 468      | 48       | 3                     | 85  | 3845     | 146      | +1                    | 35  | 8550     | 10       | 3                     | 85  | 3318     | 14       | 0                     |
| 036 | 00423    | -43      | +                     | 086 | 003992   | +147     | -1                    | 136 | 008538   | 15       | -3                    | 186 | 003176   | 141      | +1                    |
| 37  | 38       | 38       | 3                     | 87  | 4138     | 147      | +1                    | 37  | 851      | 20       | 3                     | 87  | 3036     | 139      | 1                     |
| 38  | 347      | 33       |                       | 88  | 485      | 147      | 0                     | 38  | 8498     | 25       |                       | 88  | 2898     | 137      | 1                     |
| 39  | 316      | 8        | 3                     | 89  | 443      | 148      | +1                    | 39  | 8471     | 30       | 3                     | 89  | 2762     | 135      | 1                     |
| 40  | 291      | 3        | 3                     | 90  | 4580     | 147      | -1                    | 40  | 8438     | 35       | 2                     | 90  | 2628     | 133      | 1                     |
| 041 | 0071     | -18      | +3                    | 091 | 004726   | +147     | +1                    | 141 | 008401   | -40      | -3                    | 191 | 002496   | -131     | +1                    |
| 42  | 256      | 13       | 3                     | 92  | 4873     | 147      | -1                    | 42  | 8358     | 46       | 3                     | 92  | 2366     | 129      | 2                     |
| 43  | 246      | 8        | 3                     | 93  | 519      | 146      | 1                     | 43  | 8310     | 51       | 3                     | 93  | 239      | 126      | 1                     |
| 44  | 41       | -2       | 3                     | 94  | 5164     | 145      | 1                     | 44  | 8257     | 55       |                       | 94  | 114      | 123      | 2                     |
| 45  | 24       | +4       | 3                     | 95  | 5308     | 144      | 1                     | 45  | 800      | 60       | 3                     | 95  | 1993     | 120      | 2                     |
| 046 | 00048    | +9       | +3                    | 096 | 005451   | +143     | -1                    | 146 | 008138   | -65      | -3                    | 196 | 001874   | -117     | +2                    |
| 47  | 259      | 14       | 3                     | 97  | 5593     | 141      | 1                     | 47  | 8071     | 70       | 3                     | 97  | 1759     | 114      | 2                     |
| 48  | 75       | 19       | 3                     | 98  | 5733     | 140      | 1                     | 48  | 7999     | 74       |                       | 98  | 1647     | 111      | 2                     |
| 49  | 296      | 24       | 3                     | 99  | 5872     | 138      |                       | 49  | 793      | 78       |                       | 99  | 1538     | 107      | 3                     |
| 050 | 00033    | +29      | +2                    | 100 | 00608    | +136     | -1                    | 150 | 007843   | -83      | -3                    | 200 | 001434   | -102     | +2                    |

Applied to 4400



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXVIII continued

Equation of Longitude

Argument Q

| 1         | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     |
|-----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|
| Q         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| d<br>2'00 | o'01434       | -103     | +2                    | d<br>2'50 | o'02127       | +124     | +2                    | d<br>3'00 | o'08263       | +55      | -2                    | d<br>3'50 | o'05149       | -146     | -1                    |
| 01        | 1333          | 100      | 2                     | 51        | 2252          | 126      | 1                     | 01        | 8315          | 50       | 3                     | 51        | 5004          | 146      | 0                     |
| 02        | 1234          | 96       | 2                     | 52        | 2380          | 130      | 2                     | 02        | 8363          | 46       | 3                     | 52        | 4858          | 147      | 0                     |
| 03        | 1141          | 91       | 2                     | 53        | 2509          | 131      | 1                     | 03        | 8404          | 40       | 3                     | 53        | 4711          | 147      | 0                     |
| 04        | 1053          | 87       | 2                     | 54        | 2641          | 133      | 1                     | 04        | 8442          | 35       | 3                     | 54        | 4564          | 147      | 0                     |
| 05        | 967           | 83       | 2                     | 55        | 2776          | 137      | 2                     | 05        | 8474          | 30       | 2                     | 55        | 4417          | 147      | 0                     |
| 2'06      | o'00886       | -79      | +2                    | 2'56      | o'02912       | +138     | +1                    | 3'06      | o'08501       | +24      | -3                    | 3'56      | o'04270       | -147     | 0                     |
| 07        | 810           | 74       | 2                     | 57        | 3051          | 141      | 2                     | 07        | 8522          | 18       | 4                     | 57        | 4123          | 147      | 0                     |
| 08        | 738           | 70       | 2                     | 58        | 3191          | 142      | 1                     | 08        | 8540          | 14       | 2                     | 58        | 3976          | 146      | +1                    |
| 09        | 669           | 66       | 2                     | 59        | 3333          | 143      | 1                     | 09        | 8552          | 9        | 3                     | 59        | 3831          | 146      | 0                     |
| 10        | 607           | 61       | 2                     | 60        | 3475          | 144      | 1                     | 10        | 8558          | +3       | 3                     | 60        | 3685          | 145      | +1                    |
| 2'11      | o'00549       | -56      | +2                    | 2'61      | o'03619       | +145     | +1                    | 3'11      | o'08559       | -2       | -3                    | 3'61      | o'03540       | -144     | +1                    |
| 12        | 496           | 51       | 2                     | 62        | 3764          | 145      | 0                     | 12        | 8554          | 8        | 3                     | 62        | 3397          | 142      | +1                    |
| 13        | 447           | 46       | 2                     | 63        | 3909          | 147      | -1                    | 13        | 8545          | 13       | 3                     | 63        | 3255          | 142      | 0                     |
| 14        | 404           | 41       | 2                     | 64        | 4057          | 146      | +1                    | 14        | 8531          | 18       | 3                     | 64        | 3114          | 140      | +1                    |
| 15        | 366           | 36       | 2                     | 65        | 4203          | 147      | 0                     | 15        | 8512          | 23       | 3                     | 65        | 2975          | 138      | 1                     |
| 2'16      | o'00333       | -31      | +2                    | 2'66      | o'04350       | +147     | +1                    | 3'16      | o'08487       | -27      | -2                    | 3'66      | o'02838       | -136     | +1                    |
| 17        | 304           | 26       | 2                     | 67        | 4497          | 148      | 0                     | 17        | 8457          | 32       | 3                     | 67        | 2702          | 134      | 1                     |
| 18        | 281           | 21       | 3                     | 68        | 4645          | 147      | 0                     | 18        | 8422          | 37       | 2                     | 68        | 2569          | 132      | 1                     |
| 19        | 264           | 16       | 3                     | 69        | 4791          | 147      | 0                     | 19        | 8383          | 43       | 3                     | 69        | 2438          | 130      | 1                     |
| 20        | 251           | 11       | 3                     | 70        | 4938          | 147      | 0                     | 20        | 8337          | 49       | 3                     | 70        | 2309          | 127      | 2                     |
| 2'21      | o'00243       | -6       | +3                    | 2'71      | o'05083       | +146     | -1                    | 3'21      | o'08287       | -54      | -3                    | 3'71      | o'02183       | -125     | +1                    |
| 22        | 240           | 0        | 3                     | 72        | 5228          | 144      | 1                     | 22        | 8232          | 57       | 2                     | 72        | 2060          | 121      | 2                     |
| 23        | 244           | +6       | 3                     | 73        | 5372          | 143      | 1                     | 23        | 8173          | 63       | 3                     | 73        | 1941          | 118      | 2                     |
| 24        | 252           | 11       | 3                     | 74        | 5514          | 142      | 1                     | 24        | 8109          | 68       | 3                     | 74        | 1823          | 115      | 2                     |
| 25        | 266           | 16       | 3                     | 75        | 5655          | 140      | 1                     | 25        | 8040          | 73       | 3                     | 75        | 1709          | 112      | 2                     |
| 2'26      | o'00284       | +21      | +3                    | 2'76      | o'05795       | +139     | -1                    | 3'26      | o'07966       | -76      | -2                    | 3'76      | o'01598       | -109     | +2                    |
| 27        | 307           | 26       | 3                     | 77        | 5932          | 136      | 2                     | 27        | 7888          | 80       | 2                     | 77        | 1491          | 104      | 3                     |
| 28        | 336           | 31       | 3                     | 78        | 6068          | 135      | 1                     | 28        | 7806          | 86       | 3                     | 78        | 1389          | 100      | 2                     |
| 29        | 369           | 36       | 3                     | 79        | 6202          | 132      | 1                     | 29        | 7719          | 89       | 2                     | 79        | 1289          | 97       | 2                     |
| 30        | 409           | 42       | 3                     | 80        | 6333          | 131      | 2                     | 30        | 7628          | 93       | 2                     | 80        | 1193          | 93       | 2                     |
| 2'31      | o'00453       | +46      | +2                    | 2'81      | o'06462       | +127     | -1                    | 3'31      | o'07534       | -97      | -2                    | 3'81      | o'01102       | -89      | +2                    |
| 32        | 501           | 51       | 3                     | 82        | 6589          | 125      | 2                     | 32        | 7435          | 101      | 2                     | 82        | 1014          | 85       | 2                     |
| 33        | 555           | 56       | 2                     | 83        | 6712          | 122      | 1                     | 33        | 7332          | 105      | 2                     | 83        | 931           | 81       | 2                     |
| 34        | 613           | 61       | 3                     | 84        | 6833          | 120      | 2                     | 34        | 7227          | 108      | 2                     | 84        | 852           | 76       | 2                     |
| 35        | 677           | 66       | 3                     | 85        | 6952          | 116      | 1                     | 35        | 7117          | 112      | 2                     | 85        | 777           | 72       | 2                     |
| 2'36      | o'00745       | +71      | +3                    | 2'86      | o'07066       | +113     | -2                    | 3'36      | o'07003       | -116     | -2                    | 3'86      | o'00707       | -68      | +3                    |
| 37        | 818           | 75       | 2                     | 87        | 7178          | 109      | 2                     | 37        | 6887          | 119      | 2                     | 87        | 642           | 63       | 3                     |
| 38        | 894           | 79       | 2                     | 88        | 7285          | 106      | 2                     | 38        | 6768          | 121      | 2                     | 88        | 581           | 58       | 3                     |
| 39        | 976           | 84       | 3                     | 89        | 7389          | 102      | 2                     | 39        | 6645          | 124      | 2                     | 89        | 525           | 53       | 2                     |
| 40        | 1061          | 88       | 2                     | 90        | 7490          | 98       | 2                     | 40        | 6520          | 127      | 2                     | 90        | 474           | 48       | 3                     |
| 2'41      | o'01151       | +92      | +2                    | 2'91      | o'07586       | +94      | -2                    | 3'41      | o'06393       | -129     | -1                    | 3'91      | o'00428       | -43      | +2                    |
| 42        | 1245          | 96       | 2                     | 92        | 7679          | 91       | 2                     | 42        | 6262          | 132      | 2                     | 92        | 387           | 38       | 3                     |
| 43        | 1343          | 100      | 2                     | 93        | 7768          | 87       | 2                     | 43        | 6129          | 134      | 1                     | 93        | 351           | 33       | 2                     |
| 44        | 1444          | 104      | 2                     | 94        | 7852          | 82       | 2                     | 44        | 5994          | 136      | 1                     | 94        | 319           | 28       | 3                     |
| 45        | 1550          | 108      | 2                     | 95        | 7932          | 78       | 3                     | 45        | 5858          | 138      | 1                     | 95        | 294           | 23       | 3                     |
| 2'46      | o'01659       | +111     | +2                    | 2'96      | o'08007       | +73      | -2                    | 3'46      | o'05719       | -140     | -1                    | 3'96      | o'00273       | -18      | +3                    |
| 47        | 1771          | 115      | 2                     | 97        | 8078          | 69       | 2                     | 47        | 5578          | 142      | 1                     | 97        | 258           | 13       | 3                     |
| 48        | 1887          | 118      | 2                     | 98        | 8145          | 64       | 2                     | 48        | 5436          | 143      | 1                     | 98        | 247           | 8        | 3                     |
| 49        | 2006          | 120      | 1                     | 99        | 8205          | 59       | 2                     | 49        | 5294          | 144      | 1                     | 99        | 241           | -2       | 3                     |
| 2'50      | o'02127       | +124     | +2                    | 3'00      | o'08263       | +55      | -2                    | 3'50      | o'05149       | -146     | -1                    | 4'00      | o'00242       | +4       | +3                    |

Added Constant: +0'04400.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

XXIX

| R   | Equation | $\Delta$<br>01 | R   | Equation | $\Delta$<br>I |
|-----|----------|----------------|-----|----------|---------------|
| 000 | 001300   | - 45           | 100 | 01791    | + 41          |
| 02  | 1210     | 45             | 02  | 1871     | 4             |
| 04  | 1121     | 44             | 04  | 1949     | 38            |
| 06  | 1034     | 44             | 06  | 024      | 37            |
| 08  | 948      | 43             | 08  | 2095     | 35            |
| 10  | 862      | 4              | 10  | 163      | 33            |
| 012 | 000779   | - 41           | 112 | 0006     | + 30          |
| 14  | 699      | 39             | 14  | 2285     | 8             |
| 16  | 62       | 38             | 16  | 338      | 6             |
| 18  | 547      | 36             | 18  | 2387     | 3             |
| 20  | 477      | 34             | 20  | 430      | 20            |
| 022 | 000411   | - 32           | 122 | 002467   | + 17          |
| 24  | 350      | 30             | 24  | 499      | 14            |
| 26  | 93       | 27             | 26  | 524      | 11            |
| 28  | 241      | 4              | 28  | 544      | 8             |
| 30  | 195      | 2              | 30  | 2557     | 5             |
| 032 | 000154   | - 19           | 132 | 000563   | + 2           |
| 34  | 119      | 16             | 34  | 564      | - 1           |
| 36  | 90       | 13             | 36  | 2559     | 5             |
| 38  | 67       | 10             | 38  | 546      | 8             |
| 40  | 50       | 7              | 40  | 57       | 11            |
| 042 | 000039   | 4              | 142 | 000503   | - 14          |
| 44  | 35       | - 1            | 44  | 47       | 17            |
| 46  | 37       | + 6            | 46  | 436      | 19            |
| 48  | 45       | 9              | 48  | 394      | 2             |
| 50  | 60       | 9              | 50  | 346      | 5             |
| 052 | 000081   | + 1            | 152 | 00293    | - 28          |
| 54  | 108      | 14             | 54  | 2235     | 30            |
| 56  | 141      | 18             | 56  | 173      | 32            |
| 58  | 180      | 21             | 58  | 2106     | 34            |
| 60  | 24       | 4              | 60  | 035      | 36            |
| 062 | 000274   | + 26           | 162 | 01960    | - 38          |
| 64  | 329      | 29             | 64  | 188      | 40            |
| 66  | 388      | 31             | 66  | 1801     | 41            |
| 68  | 45       | 33             | 68  | 1718     | 42            |
| 70  | 51       | 36             | 70  | 1633     | 43            |
| 072 | 000593   | + 37           | 172 | 001546   | - 44          |
| 74  | 669      | 39             | 74  | 1457     | 44            |
| 76  | 748      | 40             | 76  | 1368     | 45            |
| 78  | 830      | 4              | 78  | 178      | 45            |
| 80  | 914      | 43             | 80  | 1189     | 45            |
| 082 | 001001   | + 44           | 182 | 001100   | - 44          |
| 84  | 188      | 44             | 84  | 101      | 44            |
| 86  | 1176     | 45             | 86  | 96       | 43            |
| 88  | 166      | 45             | 88  | 84       | 4             |
| 90  | 1356     | 45             | 90  | 76       | 41            |
| 092 | 01445    | + 45           | 192 | 000680   | - 39          |
| 94  | 1534     | 44             | 94  | 63       | 37            |
| 96  | 1621     | 43             | 96  | 530      | 36            |
| 98  | 1707     | 42             | 98  | 461      | 34            |
| 100 | 001791   | + 41           | 200 | 00397    | - 31          |

Appl dC t t + 3

XXX

| S   | Equation |
|-----|----------|
| 000 | 000080   |
| 04  | 71       |
| 08  | 62       |
| 12  | 53       |
| 16  | 44       |
| 20  | 36       |
| 024 | 00003    |
| 28  | 24       |
| 32  | 19       |
| 36  | 16       |
| 40  | 14       |
| 044 | 000013   |
| 48  | 14       |
| 52  | 15       |
| 56  | 18       |
| 60  | 22       |
| 064 | 000028   |
| 68  | 35       |
| 72  | 4        |
| 76  | 50       |
| 80  | 59       |
| 084 | 000069   |
| 88  | 78       |
| 92  | 88       |
| 96  | 97       |
| 100 | 106      |
| 104 | 000115   |
| 08  | 12       |
| 12  | 129      |
| 16  | 135      |
| 20  | 140      |
| 124 | 000144   |
| 28  | 146      |
| 32  | 147      |
| 36  | 147      |
| 40  | 146      |
| 144 | 000143   |
| 48  | 139      |
| 52  | 133      |
| 56  | 16       |
| 60  | 119      |
| 164 | 000111   |
| 68  | 103      |
| 72  | 93       |
| 76  | 83       |
| 80  | 74       |
| 184 | 000065   |
| 88  | 56       |
| 92  | 47       |
| 96  | 39       |
| 200 | 00003    |

Q t t + 0008

XXXI

| T  | Equation |
|----|----------|
| 00 | 000020   |
| 1  | 14       |
| 2  | 10       |
| 3  | 6        |
| 4  | 4        |
| 5  | 4        |
| 06 | 000006   |
| 7  | 10       |
| 8  | 15       |
| 9  | 21       |
| 10 | 26       |
| 11 | 000031   |
| 2  | 34       |
| 3  | 36       |
| 4  | 36       |
| 5  | 34       |
| 16 | 000029   |
| 7  | 24       |
| 8  | 19       |
| 9  | 13       |
| 20 | 000009   |

0 t t t 00

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXII

Equation of Longitude

Argument U

| 1         | 2        | 3                  | 1         | 2        | 3                  | 1         | 2        | 3                  | 1         | 2        | 3                  |
|-----------|----------|--------------------|-----------|----------|--------------------|-----------|----------|--------------------|-----------|----------|--------------------|
| U         | Equation | $\Delta_{0^d 0^m}$ | U         | Equation | $\Delta_{0^d 0^m}$ | U         | Equation | $\Delta_{0^d 0^m}$ | U         | Equation | $\Delta_{0^d 0^m}$ |
| d<br>0'00 | 0'00100  | - 3,5              | d<br>1'00 | 0'00137  | + 3,1              | d<br>2'00 | 0'00031  | - 2,5              | d<br>3'00 | 0'00190  | + 1,3              |
| '04       | 86       | 3,4                | '04       | 149      | 2,9                | '04       | 22       | 2,0                | '04       | 194      | 0,8                |
| '08       | 73       | 3,3                | '08       | 160      | 2,6                | '08       | 15       | 1,6                | '08       | 196      | + 0,4              |
| '12       | 60       | 3,1                | '12       | 170      | 2,4                | '12       | 9        | 1,3                | '12       | 197      | - 0,1              |
| '16       | 48       | 2,8                | '16       | 179      | 2,0                | '16       | 5        | 0,6                | '16       | 195      | 0,8                |
| '20       | 38       | 2,5                | '20       | 186      | 1,5                | '20       | 4        | - 0,1              | '20       | 191      | 1,1                |
| 0'24      | 0'00028  | - 2,3              | 1'24      | 0'00191  | + 1,0              | 2'24      | 0'00004  | + 0,3              | 3'24      | 0'00186  | - 1,5              |
| '28       | 20       | 1,9                | '28       | 194      | 0,6                | '28       | 6        | 0,6                | '28       | 179      | 2,0                |
| '32       | 13       | 1,5                | '32       | 196      | + 0,3              | '32       | 9        | 1,3                | '32       | 170      | 2,4                |
| '36       | 8        | 1,0                | '36       | 196      | - 0,4              | '36       | 16       | 1,8                | '36       | 160      | 2,6                |
| '40       | 5        | - 0,5              | '40       | 193      | 0,9                | '40       | 23       | 2,0                | '40       | 149      | 3,0                |
| 0'44      | 0'00004  | 0,0                | 1'44      | 0'00189  | - 1,3              | 2'44      | 0'00032  | + 2,4              | 3'44      | 0'00136  | - 3,1              |
| '48       | 5        | + 0,4              | '48       | 183      | 1,8                | '48       | 42       | 2,6                | '48       | 124      | 3,3                |
| '52       | 7        | 0,9                | '52       | 175      | 2,1                | '52       | 53       | 3,0                | '52       | 110      | 3,5                |
| '56       | 12       | 1,4                | '56       | 166      | 2,4                | '56       | 66       | 3,3                | '56       | 96       | 3,5                |
| '60       | 18       | 1,8                | '60       | 156      | 2,8                | '60       | 79       | 3,3                | '60       | 82       | 3,4                |
| 0'64      | 0'00026  | + 2,3              | 1'64      | 0'00144  | - 3,0              | 2'64      | 0'00093  | + 3,5              | 3'64      | 0'00070  | - 3,1              |
| '68       | 36       | 2,5                | '68       | 132      | 3,1                | '68       | 107      | 3,3                | '68       | 57       | 3,0                |
| '72       | 46       | 2,8                | '72       | 119      | 3,4                | '72       | 119      | 3,1                | '72       | 46       | 2,8                |
| '76       | 58       | 3,1                | '76       | 105      | 3,5                | '76       | 132      | 3,2                | '76       | 35       | 2,6                |
| '80       | 71       | 3,3                | '80       | 91       | 3,4                | '80       | 145      | 3,0                | '80       | 25       | 2,1                |
| 0'84      | 0'00084  | + 3,4              | 1'84      | 0'00078  | - 3,3              | 2'84      | 0'00156  | + 2,8              | 3'84      | 0'00018  | - 1,8              |
| '88       | 98       | 3,4                | '88       | 65       | 3,1                | '88       | 167      | 2,5                | '88       | 11       | 1,4                |
| '92       | 111      | 3,3                | '92       | 53       | 2,9                | '92       | 176      | 2,1                | '92       | 7        | 0,9                |
| '96       | 124      | 3,3                | '96       | 42       | 2,8                | '96       | 184      | 1,8                | '96       | 4        | - 0,4              |
| 1'00      | 0'00137  | + 3,1              | 2'00      | 0'00031  | - 2,5              | 3'00      | 0'00190  | + 1,3              | 4'00      | 0'00004  | + 0,4              |

Applied Constant: +0'00000.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXIII      Equation of Variation of Radius Vector, Doubled      Argument A

| A    | Equation | $\Delta_{od\ or}$ | A    | Equation | $\Delta_{od\ o}$ | A    | Equation | $\Delta_{od\ or}$ | A    | Equation | $\Delta_{od\ or}$ |
|------|----------|-------------------|------|----------|------------------|------|----------|-------------------|------|----------|-------------------|
| 0 00 | - 0201   | 0                 | 1 00 | + 00298  | + 33             | 2 00 | + 01587  | - 14              | 3 00 | - 01244  | - 27              |
| 02   | 2011     | + 1               | 02   | 363      | 33               | 02   | 1558     | 15                | 02   | 1297     | 26                |
| 04   | 2007     | 3                 | 04   | 428      | 32               | 04   | 1527     | 16                | 04   | 1349     | 26                |
| 06   | 2001     | 4                 | 06   | 49       | 32               | 06   | 1494     | 17                | 06   | 1400     | 25                |
| 08   | 1993     | 5                 | 08   | 555      | 31               | 08   | 1458     | 18                | 08   | 1448     | 24                |
| 10   | 1981     | 6                 | 10   | 617      | 31               | 10   | 1421     | 19                | 10   | 1495     | 23                |
| 0 12 | - 01970  | + 7               | 1 12 | + 00679  | + 31             | 2 12 | + 01383  | - 20              | 3 12 | - 01541  | - 22              |
| 14   | 1953     | 9                 | 14   | 740      | 30               | 14   | 134      | 21                | 14   | 1584     | 1                 |
| 16   | 1934     | 10                | 16   | 799      | 29               | 16   | 1299     | 2                 | 16   | 1626     | 21                |
| 18   | 1914     | 11                | 18   | 857      | 29               | 18   | 1 54     | 23                | 18   | 1666     | 19                |
| 20   | 1891     | 1                 | 20   | 913      | 28               | 20   | 1208     | 24                | 20   | 1703     | 18                |
| 0 22 | - 01866  | + 13              | 1 22 | + 00969  | + 28             | 2 22 | + 01160  | - 25              | 3 22 | - 01739  | - 18              |
| 24   | 1838     | 14                | 24   | 1023     | 7                | 24   | 1110     | 25                | 24   | 1773     | 17                |
| 26   | 1809     | 15                | 26   | 1075     | 26               | 26   | 1059     | 26                | 26   | 1805     | 15                |
| 28   | 1777     | 17                | 28   | 11 6     | 5                | 28   | 1006     | 27                | 28   | 1834     | 14                |
| 30   | 1743     | 18                | 30   | 1176     | 25               | 30   | 952      | 28                | 30   | 186      | 13                |
| 0 32 | - 01707  | + 19              | 1 32 | + 01224  | + 24             | 2 32 | + 00896  | - 28              | 3 32 | - 01887  | - 12              |
| 34   | 1669     | 20                | 34   | 1270     | 23               | 34   | 839      | 29                | 34   | 1910     | 11                |
| 36   | 1629     | 21                | 36   | 1314     | 21               | 36   | 781      | 29                | 36   | 1931     | 10                |
| 38   | 1587     | 22                | 38   | 1356     | 21               | 38   | 7        | 30                | 38   | 1949     | 9                 |
| 40   | 1543     | 3                 | 40   | 1396     | 20               | 40   | 66       | 30                | 40   | 1965     | 8                 |
| 0 42 | - 01497  | + 24              | 1 42 | + 01435  | + 19             | 2 42 | + 00601  | - 31              | 3 42 | - 01979  | - 6               |
| 44   | 1449     | 24                | 44   | 147      | 18               | 44   | 539      | 31                | 44   | 1990     | 5                 |
| 46   | 1400     | 5                 | 46   | 1506     | 17               | 46   | 476      | 3                 | 46   | 1999     | 4                 |
| 48   | 1349     | 6                 | 48   | 1539     | 16               | 48   | 41       | 32                | 48   | 2006     | 3                 |
| 50   | 1 96     | 7                 | 50   | 1569     | 15               | 50   | 347      | 33                | 50   | 2010     | - 2               |
| 0 52 | - 0124   | + 27              | 1 52 | + 01597  | + 14             | 2 52 | + 00282  | - 33              | 3 52 | - 02012  | 0                 |
| 54   | 1188     | 8                 | 54   | 1623     | 12               | 54   | 217      | 33                | 54   | 2011     | + 1               |
| 56   | 1131     | 29                | 56   | 1647     | 11               | 56   | 151      | 33                | 56   | 20 8     | 2                 |
| 58   | 1073     | 29                | 58   | 1669     | 10               | 58   | 84       | 33                | 58   | 2003     | 3                 |
| 60   | 1014     | 30                | 60   | 1688     | 9                | 60   | + 18     | 33                | 60   | 1995     | 5                 |
| 0 62 | - 0953   | + 31              | 1 62 | + 01705  | + 8              | 2 62 | - 00049  | - 34              | 3 62 | - 01985  | + 6               |
| 64   | 89       | 31                | 64   | 17 0     | 7                | 64   | 116      | 34                | 64   | 1973     | 7                 |
| 66   | 830      | 32                | 66   | 1733     | 6                | 66   | 183      | 34                | 66   | 1958     | 8                 |
| 68   | 766      | 3                 | 68   | 174      | 4                | 68   | 250      | 34                | 68   | 1941     | 9                 |
| 70   | 702      | 3                 | 70   | 1750     | 3                | 70   | 317      | 33                | 70   | 1921     | 10                |
| 0 72 | - 0 637  | + 33              | 1 72 | + 01756  | + 2              | 2 72 | - 00383  | - 33              | 3 72 | - 01900  | + 11              |
| 74   | 57       | 33                | 74   | 1759     | + 1              | 74   | 449      | 33                | 74   | 1876     | 13                |
| 76   | 506      | 33                | 76   | 1760     | 0                | 76   | 515      | 33                | 76   | 1850     | 14                |
| 78   | 440      | 34                | 78   | 1758     | - 2              | 78   | 580      | 33                | 78   | 1821     | 15                |
| 80   | 373      | 34                | 80   | 1754     | 3                | 80   | 645      | 32                | 80   | 1791     | 16                |
| 0 82 | - 00306  | + 34              | 1 82 | + 01748  | - 4              | 2 82 | - 00709  | - 32              | 3 82 | - 01758  | + 17              |
| 84   | 38       | 34                | 84   | 1739     | 5                | 84   | 772      | 32                | 84   | 1723     | 18                |
| 86   | 171      | 34                | 86   | 1729     | 6                | 86   | 835      | 31                | 86   | 1687     | 19                |
| 88   | 103      | 34                | 88   | 1715     | 7                | 88   | 897      | 31                | 88   | 1648     | 20                |
| 90   | - 35     | 34                | 90   | 1700     | 8                | 90   | 958      | 30                | 90   | 1607     | 21                |
| 0 92 | + 0003   | + 34              | 1 92 | + 0168   | - 10             | 2 92 | - 01017  | - 30              | 3 92 | - 01565  | + 22              |
| 94   | 99       | 33                | 94   | 1662     | 11               | 94   | 1076     | 29                | 94   | 15 0     | 23                |
| 96   | 165      | 33                | 96   | 1639     | 12               | 96   | 1133     | 28                | 96   | 1474     | 24                |
| 98   | 23       | 33                | 98   | 1614     | 13               | 98   | 1189     | 28                | 98   | 14 6     | 24                |
| 1 00 | + 00298  | + 33              | 2 00 | + 01587  | - 14             | 3 00 | - 01244  | - 27              | 4 00 | - 01377  | + 25              |

Applied to the  
The Equations of the Tables are computed by the Tables XXXIV XXXV XXXVI

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXIII continued Equation of Variation of Radius Vector, Doubled Argument A

| 1    | 2        | 3                      | 1    | 2        | 3                      | 1    | 2        | 3                      | 1    | 2        | 3                      |
|------|----------|------------------------|------|----------|------------------------|------|----------|------------------------|------|----------|------------------------|
| A    | Equation | $\Delta_{0d \cdot 01}$ | A    | Equation | $\Delta_{0d \cdot 01}$ | A    | Equation | $\Delta_{0d \cdot 01}$ | A    | Equation | $\Delta_{0d \cdot 01}$ |
| d    |          |                        | d    |          |                        | d    |          |                        | d    |          |                        |
| 4.00 | -01377   | + 25                   | 5.00 | +01509   | + 17                   | 6.00 | +00463   | - 32                   | 7.00 | -02004   | - 3                    |
| .02  | 1326     | 26                     | .02  | 1542     | 16                     | .02  | 399      | 32                     | .02  | 2009     | 2                      |
| .04  | 1273     | 27                     | .04  | 1571     | 14                     | .04  | 334      | 33                     | .04  | 2012     | - 1                    |
| .06  | 1219     | 28                     | .06  | 1599     | 14                     | .06  | 268      | 33                     | .06  | 2012     | + 1                    |
| .08  | 1163     | 28                     | .08  | 1626     | 13                     | .08  | 202      | 33                     | .08  | 2010     | 2                      |
| .10  | 1107     | 28                     | .10  | 1649     | 11                     | .10  | 135      | 34                     | .10  | 2005     | 3                      |
| 4.12 | -01050   | + 29                   | 5.12 | +01671   | + 10                   | 6.12 | +00068   | - 34                   | 7.12 | -01998   | + 4                    |
| .14  | 991      | 30                     | .14  | 1690     | 9                      | .14  | + 1      | 34                     | .14  | 1988     | 6                      |
| .16  | 930      | 31                     | .16  | 1707     | 8                      | .16  | - 66     | 34                     | .16  | 1975     | 7                      |
| .18  | 869      | 31                     | .18  | 1721     | 7                      | .18  | 134      | 34                     | .18  | 1960     | 8                      |
| .20  | 807      | 31                     | .20  | 1734     | 6                      | .20  | 201      | 34                     | .20  | 1944     | 9                      |
| 4.22 | -00744   | + 32                   | 5.22 | +01743   | + 4                    | 6.22 | -00268   | - 34                   | 7.22 | -01924   | + 10                   |
| .24  | 680      | 32                     | .24  | 1751     | 4                      | .24  | 336      | 34                     | .24  | 1903     | 11                     |
| .26  | 616      | 32                     | .26  | 1757     | 2                      | .26  | 403      | 34                     | .26  | 1880     | 13                     |
| .28  | 551      | 33                     | .28  | 1760     | + 1                    | .28  | 470      | 33                     | .28  | 1853     | 14                     |
| .30  | 485      | 33                     | .30  | 1760     | - 1                    | .30  | 536      | 33                     | .30  | 1825     | 15                     |
| 4.32 | -00419   | + 33                   | 5.32 | +01758   | - 2                    | 6.32 | -00602   | - 33                   | 7.32 | -01794   | + 16                   |
| .34  | 353      | 33                     | .34  | 1754     | 3                      | .34  | 667      | 32                     | .34  | 1761     | 17                     |
| .36  | 286      | 34                     | .36  | 1748     | 4                      | .36  | 731      | 32                     | .36  | 1727     | 18                     |
| .38  | 219      | 34                     | .38  | 1739     | 5                      | .38  | 795      | 32                     | .38  | 1690     | 19                     |
| .40  | 152      | 33                     | .40  | 1728     | 6                      | .40  | 858      | 31                     | .40  | 1651     | 20                     |
| 4.42 | -00086   | + 33                   | 5.42 | +01714   | - 8                    | 6.42 | -00920   | - 31                   | 7.42 | -01609   | + 21                   |
| .44  | - 19     | 34                     | .44  | 1698     | 9                      | .44  | 981      | 30                     | .44  | 1566     | 22                     |
| .46  | + 48     | 33                     | .46  | 1680     | 10                     | .46  | 1040     | 30                     | .46  | 1522     | 23                     |
| .48  | 114      | 33                     | .48  | 1660     | 11                     | .48  | 1099     | 29                     | .48  | 1476     | 24                     |
| .50  | 181      | 33                     | .50  | 1637     | 12                     | .50  | 1156     | 29                     | .50  | 1427     | 25                     |
| 4.52 | +00247   | + 33                   | 5.52 | +01612   | - 13                   | 6.52 | -01213   | - 28                   | 7.52 | -01377   | + 25                   |
| .54  | 312      | 32                     | .54  | 1585     | 14                     | .54  | 1268     | 27                     | .54  | 1326     | 26                     |
| .56  | 376      | 32                     | .56  | 1556     | 15                     | .56  | 1321     | 26                     | .56  | 1273     | 27                     |
| .58  | 441      | 32                     | .58  | 1525     | 16                     | .58  | 1373     | 26                     | .58  | 1218     | 28                     |
| .60  | 504      | 32                     | .60  | 1491     | 18                     | .60  | 1423     | 25                     | .60  | 1162     | 29                     |
| 4.62 | +00567   | + 31                   | 5.62 | +01455   | - 19                   | 6.62 | -01471   | - 24                   | 7.62 | -01104   | + 29                   |
| .64  | 628      | 31                     | .64  | 1417     | 19                     | .64  | 1518     | 23                     | .64  | 1046     | 29                     |
| .66  | 689      | 30                     | .66  | 1378     | 20                     | .66  | 1563     | 22                     | .66  | 987      | 30                     |
| .68  | 749      | 30                     | .68  | 1336     | 21                     | .68  | 1606     | 21                     | .68  | 926      | 31                     |
| .70  | 808      | 29                     | .70  | 1293     | 22                     | .70  | 1647     | 20                     | .70  | 864      | 31                     |
| 4.72 | +00865   | + 28                   | 5.72 | +01249   | - 23                   | 6.72 | -01686   | - 19                   | 7.72 | -00801   | + 32                   |
| .74  | 921      | 28                     | .74  | 1202     | 24                     | .74  | 1723     | 18                     | .74  | 738      | 32                     |
| .76  | 976      | 27                     | .76  | 1154     | 25                     | .76  | 1758     | 17                     | .76  | 673      | 33                     |
| .78  | 1030     | 27                     | .78  | 1104     | 26                     | .78  | 1791     | 16                     | .78  | 608      | 33                     |
| .80  | 1082     | 26                     | .80  | 1051     | 27                     | .80  | 1823     | 15                     | .80  | 542      | 33                     |
| 4.82 | +01132   | + 25                   | 5.82 | +00998   | - 27                   | 6.82 | -01851   | - 14                   | 7.82 | -00476   | + 33                   |
| .84  | 1180     | 24                     | .84  | 944      | 28                     | .84  | 1877     | 13                     | .84  | 409      | 34                     |
| .86  | 1228     | 24                     | .86  | 888      | 28                     | .86  | 1901     | 11                     | .86  | 342      | 34                     |
| .88  | 1274     | 23                     | .88  | 831      | 29                     | .88  | 1922     | 10                     | .88  | 275      | 34                     |
| .90  | 1318     | 22                     | .90  | 772      | 30                     | .90  | 1942     | 10                     | .90  | 208      | 34                     |
| 4.92 | +01360   | + 21                   | 5.92 | +00712   | - 30                   | 6.92 | -01960   | - 8                    | 7.92 | -00140   | + 34                   |
| .94  | 1400     | 20                     | .94  | 651      | 31                     | .94  | 1974     | 7                      | .94  | 72       | 34                     |
| .96  | 1439     | 19                     | .96  | 589      | 31                     | .96  | 1986     | 6                      | .96  | - 5      | 34                     |
| .98  | 1475     | 18                     | .98  | 527      | 32                     | .98  | 1996     | 5                      | .98  | + 62     | 34                     |
| 5.00 | +01509   | + 17                   | 6.00 | +00463   | - 32                   | 7.00 | -02004   | - 3                    | 8.00 | +00129   | + 34                   |

Applied Constant : -0020.

The Equation of this Table must be supplemented by those of Tables XXXIV, XXXV, XXXVI.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Variation of Radius Vector, Doubled

XXXIV

| D  | Equation |
|----|----------|
| 00 | + 00003  |
| 2  | 4        |
| 4  | 7        |
| 6  | 12       |
| 8  | 17       |
| 10 | 3        |
| 12 | + 00029  |
| 4  | 33       |
| 6  | 36       |
| 8  | 37       |
| 20 | 36       |
| 22 | + 00032  |
| 4  | 8        |
| 6  | 2        |
| 8  | 16       |
| 30 | 10       |
| 32 | + 0 006  |
| 4  | 4        |
| 6  | 3        |
| 8  | 5        |
| 40 | + 0008   |

0 t t +

XXXV

| E  | Equation | E  | Equation |
|----|----------|----|----------|
| 00 | + 00008  | 20 | + 001 7  |
| 1  | 9        | 1  | 1 2      |
| 2  | 12       | 2  | 115      |
| 3  | 16       | 3  | 107      |
| 4  | 23       | 4  | 98       |
| 5  | 31       | 5  | 88       |
| 06 | + 00040  | 26 | + 00077  |
| 7  | 50       | 7  | 66       |
| 8  | 60       | 8  | 55       |
| 9  | 71       | 9  | 45       |
| 10 | 8        | 30 | 35       |
| 11 | + 0093   | 31 | + 00027  |
| 2  | 10       | 2  | 0        |
| 3  | 111      | 3  | 14       |
| 4  | 119      | 4  | 10       |
| 5  | 1 5      | 5  | 8        |
| 16 | + 001 9  | 36 | + 000 8  |
| 7  | 131      | 7  | 10       |
| 8  | 132      | 8  | 14       |
| 9  | 131      | 9  | 19       |
| 20 | + 00127  | 40 | + 000 7  |

Appl d C t t + 0007

XXXVI

| F  | Equation |
|----|----------|
| 00 | + 00004  |
| 2  | 6        |
| 4  | 10       |
| 6  | 17       |
| 8  | 26       |
| 10 | 35       |
| 12 | + 00044  |
| 4  | 50       |
| 6  | 55       |
| 8  | 56       |
| 20 | 54       |
| 22 | + 00049  |
| 4  | 42       |
| 6  | 33       |
| 8  | 24       |
| 30 | 15       |
| 32 | + 00009  |
| 4  | 5        |
| 6  | 4        |
| 8  | 6        |
| 40 | + 0001   |

0 t t + 00

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXVII

Equation of Latitude

Argument Q

| 1    | 2             | 3        | 4                     | 1    | 2             | 3        | 4                     | 1    | 2             | 3        | 4                     | 1    | 2             | 3        | 4                     |
|------|---------------|----------|-----------------------|------|---------------|----------|-----------------------|------|---------------|----------|-----------------------|------|---------------|----------|-----------------------|
| Q    | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q    | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q    | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | Q    | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| a    |               |          |                       | d    |               |          |                       | a    |               |          |                       | a    |               |          |                       |
| 0.00 | 0.60000       | +954     | 0                     | 0.50 | 1.01772       | +607     | -7                    | 1.00 | 1.12958       | -189     | -9                    | 1.50 | 0.85280       | -844     | -4                    |
| .01  | .60954        | 954      | 0                     | .51  | 1.02372       | 594      | 7                     | .01  | 1.12760       | 206      | 9                     | .51  | .84432        | 852      | 4                     |
| .02  | .61908        | 954      | 0                     | .52  | 1.02959       | 580      | 7                     | .02  | 1.12546       | 223      | 9                     | .52  | .83576        | 858      | 4                     |
| .03  | .62862        | 954      | -1                    | .53  | 1.03532       | 566      | 7                     | .03  | 1.12315       | 239      | 8                     | .53  | .82715        | 866      | 4                     |
| .04  | .63815        | 952      | 1                     | .54  | 1.04091       | 553      | 7                     | .04  | 1.12069       | 255      | 8                     | .54  | .81845        | 873      | 4                     |
| .05  | .64766        | 951      | 1                     | .55  | 1.04637       | 539      | 7                     | .05  | 1.11806       | 271      | 9                     | .55  | .80969        | 880      | 4                     |
| 0.06 | 0.65716       | +949     | -1                    | 0.56 | 1.05169       | +525     | -8                    | 1.06 | 1.11526       | -288     | -8                    | 1.56 | 0.80085       | -887     | -3                    |
| .07  | .66664        | 947      | 1                     | .57  | 1.05686       | 510      | 7                     | .07  | 1.11230       | 304      | 8                     | .57  | .79196        | 893      | 3                     |
| .08  | .67610        | 945      | 1                     | .58  | 1.06189       | 496      | 7                     | .08  | 1.10918       | 320      | 8                     | .58  | .78300        | 899      | 3                     |
| .09  | .68554        | 943      | 2                     | .59  | 1.06678       | 482      | 8                     | .09  | 1.10590       | 336      | 8                     | .59  | .77399        | 904      | 3                     |
| .10  | .69495        | 940      | 2                     | .60  | 1.07152       | 467      | 8                     | .10  | 1.10246       | 352      | 8                     | .60  | .76491        | 908      | 3                     |
| 0.11 | 0.70433       | +937     | -2                    | 0.61 | 1.07611       | +452     | -8                    | 1.11 | 1.09887       | -367     | -8                    | 1.61 | 0.75581       | -914     | -3                    |
| .12  | .71368        | 933      | 2                     | .62  | 1.08055       | 437      | 8                     | .12  | 1.09513       | 383      | 8                     | .62  | .74664        | 919      | 3                     |
| .13  | .72299        | 929      | 2                     | .63  | 1.08484       | 422      | 8                     | .13  | 1.09123       | 398      | 8                     | .63  | .73743        | 923      | 2                     |
| .14  | .73226        | 925      | 2                     | .64  | 1.08898       | 407      | 8                     | .14  | 1.08717       | 414      | 8                     | .64  | .72818        | 927      | 2                     |
| .15  | .74149        | 921      | 2                     | .65  | 1.09297       | 392      | 8                     | .15  | 1.08296       | 429      | 8                     | .65  | .71889        | 931      | 2                     |
| 0.16 | 0.75069       | +917     | -3                    | 0.66 | 1.09681       | +376     | -8                    | 1.16 | 1.07859       | -444     | -8                    | 1.66 | 0.70956       | -935     | -2                    |
| .17  | .75983        | 912      | 3                     | .67  | 1.10049       | 360      | 8                     | .17  | 1.07408       | 459      | 8                     | .67  | .70020        | 938      | 2                     |
| .18  | .76893        | 907      | 3                     | .68  | 1.10402       | 345      | 8                     | .18  | 1.06942       | 473      | 7                     | .68  | .69080        | 941      | 2                     |
| .19  | .77797        | 902      | 3                     | .69  | 1.10739       | 329      | 8                     | .19  | 1.06463       | 486      | 8                     | .69  | .68138        | 944      | 2                     |
| .20  | .78696        | 896      | 3                     | .70  | 1.11060       | 313      | 8                     | .20  | 1.05968       | 503      | 8                     | .70  | .67193        | 946      | 1                     |
| 0.21 | 0.79588       | +890     | -3                    | 0.71 | 1.11365       | +297     | -8                    | 1.21 | 1.05458       | -517     | -7                    | 1.71 | 0.66246       | -948     | -1                    |
| .22  | .80475        | 884      | 3                     | .72  | 1.11654       | 281      | 9                     | .22  | 1.04934       | 531      | 7                     | .72  | .65297        | 950      | 1                     |
| .23  | .81355        | 877      | 4                     | .73  | 1.11926       | 264      | 8                     | .23  | 1.04396       | 545      | 7                     | .73  | .64346        | 952      | 1                     |
| .24  | .82229        | 870      | 4                     | .74  | 1.12181       | 248      | 8                     | .24  | 1.03844       | 559      | 7                     | .74  | .63394        | 953      | 1                     |
| .25  | .83095        | 864      | 4                     | .75  | 1.12421       | 232      | 9                     | .25  | 1.03279       | 572      | 7                     | .75  | .62441        | 954      | -1                    |
| 0.26 | 0.83955       | +856     | -4                    | 0.76 | 1.12644       | +215     | -8                    | 1.26 | 1.02700       | -586     | -7                    | 1.76 | 0.61487       | -954     | 0                     |
| .27  | .84807        | 849      | 4                     | .77  | 1.12851       | 198      | 9                     | .27  | 1.02108       | 599      | 7                     | .77  | .60533        | 954      | 0                     |
| .28  | .85652        | 841      | 4                     | .78  | 1.13040       | 182      | 8                     | .28  | 1.01502       | 613      | 7                     | .78  | .59579        | 954      | 0                     |
| .29  | .86489        | 833      | 5                     | .79  | 1.13214       | 165      | 9                     | .29  | 1.00883       | 625      | 6                     | .79  | .58625        | 954      | 0                     |
| .30  | .87317        | 824      | 4                     | .80  | 1.13370       | 148      | 9                     | .30  | 1.00253       | 638      | 7                     | .80  | .57671        | 954      | +1                    |
| 0.31 | 0.88137       | +816     | -5                    | 0.81 | 1.13510       | +132     | -8                    | 1.31 | 0.99609       | -650     | -6                    | 1.81 | 0.56719       | -953     | +1                    |
| .32  | .88948        | 807      | 5                     | .82  | 1.13633       | 115      | 9                     | .32  | .98953        | 663      | 7                     | .82  | .55767        | 952      | 1                     |
| .33  | .89751        | 798      | 5                     | .83  | 1.13739       | 98       | 9                     | .33  | .98284        | 675      | 6                     | .83  | .54816        | 950      | 1                     |
| .34  | .90543        | 789      | 5                     | .84  | 1.13828       | 81       | 9                     | .34  | .97603        | 687      | 6                     | .84  | .53867        | 948      | 1                     |
| .35  | .91326        | 779      | 5                     | .85  | 1.13901       | 64       | 9                     | .35  | .96911        | 696      | 6                     | .85  | .52920        | 946      | 1                     |
| 0.36 | 0.92099       | +769     | -5                    | 0.86 | 1.13956       | +47      | -8                    | 1.36 | 0.96210       | -708     | -7                    | 1.86 | 0.51975       | -945     | +2                    |
| .37  | .92863        | 759      | 5                     | .87  | 1.13995       | 31       | 9                     | .37  | .95495        | 720      | 6                     | .87  | .51031        | 941      | 1                     |
| .38  | .93616        | 748      | 6                     | .88  | 1.14017       | +14      | 9                     | .38  | .94770        | 731      | 6                     | .88  | .50091        | 939      | 2                     |
| .39  | .94359        | 738      | 5                     | .89  | 1.14022       | -4       | 9                     | .39  | .94033        | 742      | 6                     | .89  | .49154        | 935      | 2                     |
| .40  | .95091        | 727      | 6                     | .90  | 1.14010       | 21       | 9                     | .40  | .93286        | 753      | 5                     | .90  | .48220        | 932      | 2                     |
| 0.41 | 0.95812       | +715     | -6                    | 0.91 | 1.13981       | -38      | -9                    | 1.41 | 0.92528       | -764     | -6                    | 1.91 | 0.47290       | -928     | +2                    |
| .42  | .96521        | 704      | 6                     | .92  | 1.13935       | 55       | 9                     | .42  | .91760        | 774      | 5                     | .92  | .46364        | 924      | 3                     |
| .43  | .97220        | 693      | 6                     | .93  | 1.13871       | 72       | 9                     | .43  | .90981        | 783      | 5                     | .93  | .45443        | 919      | 2                     |
| .44  | .97907        | 681      | 6                     | .94  | 1.13791       | 89       | 9                     | .44  | .90194        | 793      | 5                     | .94  | .44525        | 915      | 3                     |
| .45  | .98582        | 669      | 6                     | .95  | 1.13694       | 105      | 8                     | .45  | .89397        | 802      | 5                     | .95  | .43613        | 910      | 3                     |
| 0.46 | 0.99244       | +657     | -6                    | 0.96 | 1.13581       | -122     | -9                    | 1.46 | 0.88591       | -811     | -5                    | 1.96 | 0.42706       | -905     | +3                    |
| .47  | .99895        | 645      | 7                     | .97  | 1.13450       | 139      | 9                     | .47  | .87776        | 820      | 5                     | .97  | .41805        | 899      | 3                     |
| .48  | 1.00533       | 632      | 6                     | .98  | 1.13303       | 156      | 9                     | .48  | .86952        | 828      | 4                     | .98  | .40908        | 894      | 3                     |
| .49  | 1.01159       | 620      | 7                     | .99  | 1.13138       | 173      | 8                     | .49  | .86120        | 836      | 4                     | .99  | .40018        | 888      | 4                     |
| 0.50 | 1.01772       | +607     | -7                    | 1.00 | 1.12958       | -189     | -9                    | 1.50 | 0.85280       | -844     | -4                    | 2.00 | 0.39133       | -881     | +3                    |

Applied Constant: +0.60000.

For Eclipses, and as the argument of Table XLVII, the Equation of this Table must be supplemented by those of Tables XXXVIII-XLIV. For the other phenomena the Equations of Tables XLV, XLVI must also be applied.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXVII continued

Equation of Latitude

Argument Q

| Q                    | Equation | Δ    | $\frac{1}{2} \Delta$ | Q    | Equation | Δ    | $\frac{1}{2} \Delta$ | Q                    | Equation | Δ    | $\frac{1}{2} \Delta$ | Q                    | Equation | Δ    | $\frac{1}{2} \Delta$ |
|----------------------|----------|------|----------------------|------|----------|------|----------------------|----------------------|----------|------|----------------------|----------------------|----------|------|----------------------|
| <sup>a</sup><br>2 00 | 0 39133  | -881 | + 3                  | 2 50 | 0 08225  | -273 | + 8                  | <sup>a</sup><br>3 00 | 0 15301  | +537 | + 7                  | <sup>a</sup><br>3 50 | 0 55123  | +951 | + 1                  |
| 01                   | 38256    | 874  | 4                    | 51   | 07960    | 257  | 8                    | 01                   | 15845    | 551  | 7                    | 51                   | 56074    | 952  | + 1                  |
| 02                   | 37385    | 867  | 4                    | 52   | 0771     | 41   | 8                    | 02                   | 16403    | 565  | 7                    | 52                   | 57027    | 95   | 0                    |
| 03                   | 365 3    | 860  | 4                    | 53   | 07479    | 224  | 9                    | 03                   | 16974    | 578  | 7                    | 53                   | 57980    | 953  | + 1                  |
| 04                   | 35668    | 853  | 4                    | 54   | 07263    | 208  | 8                    | 04                   | 17559    | 591  | 7                    | 54                   | 58934    | 953  | 0                    |
| 05                   | 34819    | 845  | 4                    | 55   | 07064    | 191  | 9                    | 05                   | 18157    | 605  | 7                    | 55                   | 59888    | 953  | 0                    |
| 2 06                 | 0 33978  | -837 | + 4                  | 2 56 | 0 0688   | -174 | + 9                  | 3 06                 | 0 18768  | +617 | + 7                  | 3 56                 | 0 60842  | +953 | 0                    |
| 07                   | 33145    | 829  | 4                    | 57   | 06716    | 158  | 8                    | 07                   | 19392    | 631  | 7                    | 57                   | 61796    | 953  | 0                    |
| 08                   | 323 0    | 8 1  | 5                    | 58   | 06567    | 141  | 9                    | 08                   | 0029     | 643  | 7                    | 58                   | 62750    | 953  | - 1                  |
| 09                   | 31504    | 812  | 5                    | 59   | 06434    | 124  | 9                    | 09                   | 20679    | 656  | 6                    | 59                   | 63703    | 952  | 1                    |
| 10                   | 30697    | 803  | 5                    | 60   | 06319    | 108  | 8                    | 10                   | 21341    | 668  | 6                    | 60                   | 64654    | 951  | 1                    |
| 2 11                 | 0 29898  | -794 | + 5                  | 2 61 | 0 06 20  | - 91 | + 9                  | 3 11                 | 0 22015  | +680 | + 6                  | 3 61                 | 0 65604  | +949 | - 1                  |
| 12                   | 9110     | 784  | 5                    | 62   | 06138    | 74   | 9                    | 12                   | 2700     | 692  | 6                    | 62                   | 66552    | 947  | 1                    |
| 13                   | 8331     | 774  | 5                    | 63   | 0607     | 57   | 9                    | 13                   | 3398     | 703  | 6                    | 63                   | 67498    | 945  | 1                    |
| 14                   | 27562    | 764  | 5                    | 64   | 060 4    | 40   | 9                    | 14                   | 4106     | 714  | 6                    | 64                   | 68442    | 943  | 2                    |
| 15                   | 6802     | 754  | 6                    | 65   | 05993    | 3    | 9                    | 15                   | 248 6    | 725  | 6                    | 65                   | 69383    | 940  | 2                    |
| 2 16                 | 0 6054   | -743 | + 6                  | 2 66 | 0 05979  | - 6  | + 9                  | 3 16                 | 0 5556   | +736 | + 6                  | 3 66                 | 0 70321  | +937 | - 2                  |
| 17                   | 25316    | 733  | 5                    | 67   | 05982    | + 1  | 9                    | 17                   | 26 98    | 747  | 5                    | 67                   | 71256    | 934  | 2                    |
| 18                   | 24589    | 7 2  | 6                    | 68   | 0600     | 29   | 9                    | 18                   | 27049    | 757  | 6                    | 68                   | 72188    | 930  | 2                    |
| 19                   | 2387     | 711  | 6                    | 69   | 06039    | 45   | 8                    | 19                   | 781      | 768  | 5                    | 69                   | 73116    | 926  | 2                    |
| 20                   | 23168    | 699  | 6                    | 70   | 06092    | 62   | 9                    | 20                   | 28584    | 778  | 5                    | 70                   | 74041    | 922  | 3                    |
| 2 21                 | 0 22476  | -687 | + 6                  | 2 71 | 0 06163  | + 79 | + 9                  | 3 21                 | 0 29367  | +787 | + 5                  | 3 71                 | 0 74960  | +918 | - 2                  |
| 22                   | 21794    | 676  | 6                    | 72   | 06 50    | 96   | 9                    | 22                   | 30158    | 796  | 5                    | 72                   | 75875    | 913  | 3                    |
| 23                   | 11 4     | 664  | 6                    | 73   | 06355    | 113  | 9                    | 23                   | 30957    | 806  | 5                    | 73                   | 76785    | 908  | 3                    |
| 24                   | 20467    | 65   | 7                    | 74   | 06476    | 1 9  | 8                    | 24                   | 31767    | 815  | 5                    | 74                   | 77690    | 902  | 3                    |
| 25                   | 19822    | 639  | 6                    | 75   | 06614    | 145  | 9                    | 25                   | 32586    | 823  | 4                    | 75                   | 78589    | 897  | 3                    |
| 2 26                 | 0 19189  | -627 | + 7                  | 2 76 | 0 06767  | +163 | + 9                  | 3 26                 | 0 33413  | +832 | + 5                  | 3 76                 | 0 79483  | +891 | - 3                  |
| 27                   | 18569    | 614  | 7                    | 77   | 06940    | 180  | 8                    | 27                   | 34 49    | 840  | 4                    | 77                   | 80370    | 885  | 3                    |
| 28                   | 17962    | 601  | 7                    | 78   | 071 7    | 196  | 9                    | 28                   | 35093    | 848  | 4                    | 78                   | 81 52    | 878  | 4                    |
| 29                   | 17368    | 588  | 7                    | 79   | 733      | 12   | 8                    | 29                   | 35944    | 856  | 4                    | 79                   | 82127    | 871  | 4                    |
| 30                   | 16787    | 574  | 7                    | 80   | 0755     | 229  | 9                    | 30                   | 36803    | 862  | 4                    | 80                   | 82995    | 864  | 4                    |
| 2 31                 | 0 16 0   | -560 | + 7                  | 2 81 | 0 0779   | +246 | + 8                  | 3 31                 | 0 37669  | +869 | + 4                  | 3 81                 | 0 83855  | +857 | - 4                  |
| 32                   | 15667    | 546  | 7                    | 82   | 8044     | 263  | 9                    | 32                   | 38542    | 876  | 4                    | 82                   | 84708    | 849  | 4                    |
| 33                   | 151 8    | 53   | 7                    | 83   | 08315    | 279  | 8                    | 33                   | 39421    | 883  | 3                    | 83                   | 85554    | 842  | 4                    |
| 34                   | 146 3    | 518  | 7                    | 84   | 08601    | 295  | 8                    | 34                   | 40307    | 889  | 4                    | 84                   | 86392    | 834  | 5                    |
| 35                   | 1409     | 504  | 7                    | 85   | 08904    | 311  | 8                    | 35                   | 41199    | 896  | 3                    | 85                   | 87 21    | 825  | 4                    |
| 2 36                 | 13595    | -489 | + 8                  | 2 86 | 09 23    | +327 | + 8                  | 3 36                 | 0 42098  | +901 | + 3                  | 3 86                 | 0 8804   | +817 | - 5                  |
| 37                   | 13113    | 475  | 7                    | 87   | 09558    | 343  | 8                    | 37                   | 430 1    | 906  | 3                    | 87                   | 88855    | 808  | 5                    |
| 38                   | 1 644    | 461  | 8                    | 88   | 09908    | 358  | 8                    | 38                   | 43910    | 911  | 3                    | 88                   | 89658    | 799  | 5                    |
| 39                   | 12191    | 446  | 8                    | 89   | 10274    | 374  | 8                    | 39                   | 44823    | 916  | 3                    | 89                   | 90452    | 789  | 5                    |
| 40                   | 11753    | 431  | 8                    | 90   | 10656    | 389  | 8                    | 40                   | 45741    | 921  | 3                    | 90                   | 91 36    | 778  | 5                    |
| 2 41                 | 11330    | -416 | + 8                  | 2 91 | 0 11053  | +405 | + 8                  | 3 41                 | 0 46664  | +925 | + 2                  | 3 91                 | 0 9 008  | +769 | - 5                  |
| 42                   | 109      | 4 0  | 8                    | 92   | 11465    | 420  | 8                    | 42                   | 47592    | 929  | 2                    | 92                   | 9 772    | 759  | 5                    |
| 43                   | 1053     | 385  | 8                    | 93   | 11893    | 436  | 8                    | 43                   | 48523    | 933  | 2                    | 93                   | 93527    | 749  | 5                    |
| 44                   | 10153    | 369  | 8                    | 94   | 12336    | 451  | 8                    | 44                   | 49457    | 936  | 2                    | 94                   | 94 71    | 739  | 6                    |
| 45                   | 09792    | 353  | 8                    | 95   | 1 794    | 465  | 7                    | 45                   | 50395    | 939  | 2                    | 95                   | 95005    | 728  | 6                    |
| 2 46                 | 0 9447   | -338 | + 8                  | 2 96 | 0 13 66  | +479 | + 8                  | 3 46                 | 0 51336  | +942 | + 1                  | 3 96                 | 0 95727  | +717 | - 6                  |
| 47                   | 09117    | 3 2  | 8                    | 97   | 13753    | 495  | 8                    | 47                   | 52 79    | 945  | 2                    | 97                   | 96439    | 705  | 6                    |
| 48                   | 08803    | 306  | 9                    | 98   | 14 55    | 509  | 7                    | 48                   | 532 5    | 947  | 1                    | 98                   | 97139    | 694  | 6                    |
| 49                   | 08506    | 89   | 8                    | 99   | 14771    | 5 3  | 7                    | 49                   | 54173    | 949  | 1                    | 99                   | 978 8    | 68   | 6                    |
| 2 50                 | 0 08 5   | - 73 | + 8                  | 3 00 | 0 153 1  | +537 | + 7                  | 3 50                 | 0 551 3  | +951 | + 1                  | 4 00                 | 0 985 4  | +670 | - 6                  |

Appl dC t t + 600 F Elp d th g m t f T bl XLVII th Eq ti f this f bl m t b ppl m t d by th  
f T bl XXXVIII XLIV F th ti ph m th Eq ti f T bl XLV XLVI m t l b ppl d



# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXVIII

Equation of Latitude

Argument U

| 1         | 2             | 3                 | 4                      | 1         | 2             | 3                 | 4                      | 1         | 2             | 3                 | 4                      | 1         | 2             | 3                 | 4                      |
|-----------|---------------|-------------------|------------------------|-----------|---------------|-------------------|------------------------|-----------|---------------|-------------------|------------------------|-----------|---------------|-------------------|------------------------|
| U         | Equa-<br>tion | $\Delta$<br>0d'01 | $\frac{1}{2} \Delta^2$ | U         | Equa-<br>tion | $\Delta$<br>0d'01 | $\frac{1}{2} \Delta^2$ | U         | Equa-<br>tion | $\Delta$<br>0d'01 | $\frac{1}{2} \Delta^2$ | U         | Equa-<br>tion | $\Delta$<br>0d'01 | $\frac{1}{2} \Delta^2$ |
| d<br>0'00 | 0'09000       | +145              | 0                      | d<br>1'00 | 0'17009       | -29               | -2                     | d<br>2'00 | 0'05832       | -134              | +1                     | d<br>3'00 | 0'02244       | +82               | +2                     |
| '02       | 9289          | 145               | 0                      | '02       | '16947        | 34                | 1                      | '02       | 5567          | 131               | 0                      | '02       | 2411          | 86                | 1                      |
| '04       | 9578          | 144               | 0                      | '04       | '16874        | 39                | 2                      | '04       | 5307          | 129               | +1                     | '04       | 2586          | 90                | 1                      |
| '06       | 9866          | 144               | 0                      | '06       | '16792        | 44                | 1                      | '06       | 5052          | 127               | 0                      | '06       | 2769          | 94                | 1                      |
| '08       | '10153        | 143               | 0                      | '08       | '16700        | 48                | 1                      | '08       | 4801          | 124               | +1                     | '08       | 2960          | 98                | 1                      |
| '10       | '10438        | 142               | 0                      | '10       | '16599        | 53                | 1                      | '10       | 4556          | 122               | 0                      | '10       | 3159          | 102               | 1                      |
| 0'12      | 0'10722       | +142              | -1                     | 1'12      | 0'16488       | -58               | -2                     | 2'12      | 0'04316       | -119              | +1                     | 3'12      | 0'03365       | +105              | +1                     |
| '14       | '11004        | 141               | 0                      | '14       | '16368        | 63                | 1                      | '14       | 4082          | 116               | 1                      | '14       | 3578          | 108               | 1                      |
| '16       | '11283        | 139               | -1                     | '16       | '16238        | 67                | 2                      | '16       | 3854          | 112               | 1                      | '16       | 3797          | 112               | 1                      |
| '18       | '11559        | 138               | 0                      | '18       | '16100        | 72                | 1                      | '18       | 3633          | 109               | 1                      | '18       | 4024          | 115               | 1                      |
| '20       | '11832        | 136               | -1                     | '20       | '15952        | 76                | 1                      | '20       | 3418          | 106               | 1                      | '20       | 4256          | 118               | +1                     |
| 0'22      | 0'12101       | +134              | 0                      | 1'22      | 0'15796       | -81               | -2                     | 2'22      | 0'03210       | -102              | +1                     | 3'22      | 0'04494       | +121              | 0                      |
| '24       | '12367        | 132               | -1                     | '24       | '15631        | 85                | 1                      | '24       | 3010          | 98                | 1                      | '24       | 4738          | 123               | +1                     |
| '26       | '12628        | 130               | 0                      | '26       | '15458        | 89                | 1                      | '26       | 2817          | 95                | 1                      | '26       | 4988          | 126               | +1                     |
| '28       | '12885        | 128               | -1                     | '28       | '15277        | 93                | 1                      | '28       | 2632          | 91                | 1                      | '28       | 5242          | 129               | 0                      |
| '30       | '13137        | 125               | 0                      | '30       | '15088        | 97                | 1                      | '30       | 2455          | 87                | 1                      | '30       | 5501          | 131               | +1                     |
| 0'32      | 0'13384       | +122              | -1                     | 1'32      | 0'14891       | -101              | -1                     | 2'32      | 0'02286       | -83               | +1                     | 3'32      | 0'05765       | +133              | 0                      |
| '34       | '13625        | 120               | 1                      | '34       | '14687        | 104               | 1                      | '34       | 2125          | 78                | 1                      | '34       | 6032          | 135               | +1                     |
| '36       | '13861        | 116               | -1                     | '36       | '14476        | 108               | 1                      | '36       | 1973          | 74                | 1                      | '36       | 6303          | 137               | 1                      |
| '38       | '14090        | 113               | 0                      | '38       | '14258        | 111               | -1                     | '38       | 1830          | 69                | 1                      | '38       | 6578          | 139               | +1                     |
| '40       | '14313        | 110               | -1                     | '40       | '14033        | 114               | 0                      | '40       | 1696          | 65                | 1                      | '40       | 6856          | 140               | 0                      |
| 0'42      | 0'14529       | +107              | -1                     | 1'42      | 0'13803       | -117              | -1                     | 2'42      | 0'01571       | -60               | +1                     | 3'42      | 0'07136       | +141              | +1                     |
| '44       | '14739        | 103               | 1                      | '44       | '13566        | 120               | 1                      | '44       | 1455          | 56                | 1                      | '44       | 7419          | 142               | 0                      |
| '46       | '14941        | 99                | 1                      | '46       | '13323        | 123               | 1                      | '46       | 1349          | 51                | 2                      | '46       | 7703          | 143               | +1                     |
| '48       | '15136        | 96                | 1                      | '48       | '13075        | 126               | 1                      | '48       | 1253          | 46                | 1                      | '48       | 7990          | 144               | 0                      |
| '50       | '15323        | 92                | 1                      | '50       | '12822        | 128               | 0                      | '50       | 1166          | 41                | 2                      | '50       | 8278          | 144               | 0                      |
| 0'52      | 0'15502       | +88               | -1                     | 1'52      | 0'12564       | -130              | -1                     | 2'52      | 0'01088       | -36               | +1                     | 3'52      | 0'08566       | +144              | 0                      |
| '54       | '15673        | 84                | 1                      | '54       | '12301        | 132               | 0                      | '54       | 1021          | 32                | 2                      | '54       | 8855          | 145               | 0                      |
| '56       | '15836        | 80                | 1                      | '56       | '12035        | 134               | -1                     | '56       | 964           | 26                | 1                      | '56       | 9144          | 145               | 0                      |
| '58       | '15990        | 75                | 1                      | '58       | '11764        | 136               | 0                      | '58       | 917           | 21                | 2                      | '58       | 9433          | 145               | 0                      |
| '60       | '16135        | 71                | 1                      | '60       | '11491        | 138               | -1                     | '60       | 880           | 16                | 1                      | '60       | 9722          | 144               | 0                      |
| 0'62      | 0'16271       | +66               | -1                     | 1'62      | 0'11214       | -140              | -1                     | 2'62      | 0'00853       | -11               | +1                     | 3'62      | 0'10009       | +143              | 0                      |
| '64       | '16399        | 62                | 1                      | '64       | '10934        | 141               | 0                      | '64       | 836           | 6                 | 2                      | '64       | '10295        | 143               | 0                      |
| '66       | '16516        | 57                | 1                      | '66       | '10652        | 142               | -1                     | '66       | 830           | -1                | 1                      | '66       | '10580        | 142               | 0                      |
| '68       | '16625        | 52                | 1                      | '68       | '10368        | 143               | 0                      | '68       | 834           | +5                | 2                      | '68       | '10863        | 141               | -1                     |
| '70       | '16724        | 47                | 1                      | '70       | '10082        | 144               | -1                     | '70       | 848           | 10                | 1                      | '70       | '11143        | 140               | 0                      |
| 0'72      | 0'16814       | +43               | -2                     | 1'72      | 0'09794       | -144              | 0                      | 2'72      | 0'00872       | +15               | +2                     | 3'72      | 0'11421       | +139              | -1                     |
| '74       | '16893        | 37                | 1                      | '74       | 9506          | 144               | 0                      | '74       | 907           | 20                | 1                      | '74       | '11696        | 137               | 0                      |
| '76       | '16963        | 33                | 2                      | '76       | 9217          | 145               | 0                      | '76       | 951           | 25                | 2                      | '76       | '11967        | 135               | -1                     |
| '78       | '17023        | 28                | 2                      | '78       | 8928          | 145               | 0                      | '78       | 1006          | 30                | 1                      | '78       | '12234        | 133               | 0                      |
| '80       | '17072        | 22                | 1                      | '80       | 8639          | 145               | 0                      | '80       | 1071          | 35                | 1                      | '80       | '12498        | 131               | -1                     |
| 0'82      | 0'17112       | +18               | -2                     | 1'82      | 0'08350       | -144              | 0                      | 2'82      | 0'01145       | +40               | +2                     | 3'82      | 0'12757       | +129              | -1                     |
| '84       | '17141        | 12                | 1                      | '84       | 8062          | 144               | 0                      | '84       | 1230          | 45                | 1                      | '84       | '13011        | 126               | 0                      |
| '86       | '17160        | 7                 | 2                      | '86       | 7776          | 143               | 0                      | '86       | 1324          | 50                | 1                      | '86       | '13261        | 124               | -1                     |
| '88       | '17169        | +2                | 1                      | '88       | 7491          | 142               | 0                      | '88       | 1428          | 54                | 1                      | '88       | '13505        | 121               | 1                      |
| '90       | '17168        | -3                | 2                      | '90       | 7207          | 141               | +1                     | '90       | 1541          | 59                | 2                      | '90       | '13743        | 118               | 1                      |
| 0'92      | 0'17157       | -9                | -1                     | 1'92      | 0'06927       | -140              | 0                      | 2'92      | 0'01664       | +64               | +1                     | 3'92      | 0'13976       | +115              | -1                     |
| '94       | '17135        | 14                | 2                      | '94       | 6648          | 139               | +1                     | '94       | 1796          | 68                | 1                      | '94       | '14202        | 112               | 1                      |
| '96       | '17103        | 19                | 1                      | '96       | 6373          | 137               | 0                      | '96       | 1936          | 73                | 2                      | '96       | '14422        | 108               | 1                      |
| '98       | '17061        | 24                | 2                      | '98       | 6100          | 135               | +1                     | '98       | 2086          | 77                | 1                      | '98       | '14634        | 105               | 1                      |
| 1'00      | 0'17009       | -29               | -1                     | 2'00      | 0'05832       | -134              | 0                      | 3'00      | 0'02244       | +82               | +2                     | 4'00      | 0'14840       | +101              | -1                     |

Applied Constant: +0'09000.

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XXXIX

Equations of Latitude

XL

| V  | Equation | W   | Equation | $\Delta$<br>od or | W   | Equation | $\Delta$<br>o o | W   | Equation | $\Delta$<br>o or | W   | Equation | $\Delta$<br>od or |
|----|----------|-----|----------|-------------------|-----|----------|-----------------|-----|----------|------------------|-----|----------|-------------------|
| 00 | 0 00050  | 00  | 0 00600  | +7 8              | 100 | 0 01029  | -1 5            | 200 | 0 0431   | -7 1             | 300 | 0 0038   | +4 5              |
| 2  | 45       | 04  | 631      | 7 8               | 04  | 10       | 2 1             | 04  | 403      | 6 9              | 04  | 57       | 4 9               |
| 4  | 41       | 08  | 66       | 7 6               | 08  | 1012     | 2 6             | 08  | 376      | 6 6              | 08  | 277      | 5 1               |
| 6  | 38       | 12  | 69       | 7 6               | 12  | 1001     | 3 0             | 12  | 350      | 6 4              | 12  | 98       | 5 5               |
| 8  | 36       | 16  | 723      | 7 5               | 16  | 988      | 3 5             | 16  | 325      | 6 0              | 16  | 321      | 6 0               |
| 10 | 37       | 20  | 75       | 7 3               | 20  | 973      | 4 0             | 20  | 3        | 5 6              | 20  | 346      | 6 4               |
| 12 | 0 00038  | 024 | 0 00781  | +7 1              | 124 | 0 00956  | -4 6            | 224 | 0 00280  | -5 3             | 324 | 0 00372  | +6 5              |
| 4  | 41       | 28  | 809      | 6 8               | 28  | 936      | 5 3             | 28  | 60       | 4 9              | 28  | 398      | 6 8               |
| 6  | 46       | 32  | 835      | 6 4               | 32  | 914      | 5 5             | 32  | 241      | 4 5              | 32  | 4 6      | 7 1               |
| 8  | 5        | 36  | 860      | 6 1               | 36  | 892      | 5 6             | 36  | 24       | 4 0              | 36  | 455      | 7 4               |
| 20 | 55       | 40  | 884      | 5 9               | 40  | 869      | 5 9             | 40  | 09       | 3 4              | 40  | 485      | 7 5               |
| 22 | 0 0 06   | 044 | 0 00907  | +5 5              | 144 | 0 00845  | -6 3            | 244 | 0 00197  | -9               | 344 | 0 00515  | +7 5              |
| 4  | 63       | 48  | 9 8      | 5 1               | 48  | 819      | 6 8             | 48  | 186      | 2 5              | 48  | 545      | 7 8               |
| 6  | 64       | 52  | 948      | 4 8               | 52  | 791      | 7 0             | 52  | 177      | 2 0              | 52  | 577      | 8 0               |
| 8  | 64       | 56  | 966      | 4 4               | 56  | 763      | 7 1             | 56  | 170      | 1 5              | 56  | 609      | 7 6               |
| 30 | 6        | 60  | 983      | 3 9               | 60  | 734      | 7 4             | 60  | 165      | 0 9              | 60  | 638      | 7 5               |
| 32 | 0 00059  | 064 | 0997     | +3 3              | 164 | 0 00704  | -7 5            | 264 | 0 00163  | -0 3             | 364 | 0 00669  | +7 8              |
| 4  | 54       | 68  | 1009     | 8                 | 68  | 674      | 7 6             | 68  | 163      | +0 3             | 68  | 699      | 7 5               |
| 6  | 49       | 72  | 1019     | 2 3               | 72  | 643      | 7 6             | 72  | 165      | 0 8              | 72  | 729      | 7 5               |
| 8  | 44       | 76  | 10 7     | 1 8               | 76  | 613      | 7 8             | 76  | 169      | 1 4              | 76  | 759      | 7 3               |
| 40 | 0 00040  | 80  | 1033     | 1 3               | 80  | 581      | 7 9             | 80  | 176      | 1 9              | 80  | 787      | 7 0               |
|    |          | 084 | 0 01037  | +0 6              | 184 | 0 00550  | -7 6            | 284 | 0 00184  | +2 3             | 384 | 0 00815  | +6 8              |
|    |          | 88  | 1037     | 0                 | 88  | 520      | 7 5             | 88  | 194      | 2 8              | 88  | 841      | 6 4               |
|    |          | 92  | 1037     | -0 5              | 92  | 490      | 7 5             | 92  | 206      | 3 4              | 92  | 866      | 6 1               |
|    |          | 96  | 1034     | 1 0               | 96  | 460      | 7 4             | 96  | 1        | 4 0              | 96  | 890      | 5 9               |
|    |          | 100 | 0 010 9  | -1 5              | 200 | 0 00431  | -7 1            | 300 | 00 38    | +4 5             | 400 | 0 00913  | +5 6              |

C t t + 000

Appl d C t t | 6

XLI

XLII

XLIII

| X  | Equatio | $\Delta$ | X  | Equation | $\Delta$ |
|----|---------|----------|----|----------|----------|
| 00 | 00      | + 18     | 20 | 0 00160  | - 16     |
| 1  | 219     | 18       | 1  | 144      | 15       |
| 2  | 36      | 16       | 2  | 130      | 13       |
| 3  | 252     | 15       | 3  | 117      | 11       |
| 4  | 67      | 14       | 4  | 108      | 9        |
| 5  | 280     | 13       | 5  | 101      | 5        |
| 06 | 0 00290 | + 9      | 26 | 0098     | - 3      |
| 7  | 97      | 5        | 7  | 97       | 0        |
| 8  | 30      | + 3      | 8  | 100      | + 4      |
| 9  | 303     | 0        | 9  | 106      | 6        |
| 10 | 301     | - 3      | 30 | 115      | 10       |
| 11 | 0 00296 | - 7      | 31 | 0 00127  | + 12     |
| 2  | 88      | 9        | 2  | 140      | 15       |
| 3  | 77      | 13       | 3  | 155      | 17       |
| 4  | 64      | 14       | 4  | 173      | 18       |
| 5  | 49      | 15       | 5  | 190      | 18       |
| 16 | 0 00 3  | - 16     | 36 | 0 00209  | + 18     |
| 7  | 14      | 18       | 7  | 2 7      | 16       |
| 8  | 195     | 18       | 8  | 244      | 15       |
| 9  | 178     | 18       | 9  | 60       | 14       |
| 20 | 00160   | - 16     | 40 | 0 00 73  | + 11     |

Appl d C t t + 00

| Y  | Equation |
|----|----------|
| 00 | 0 00050  |
| 2  | 41       |
| 4  | 34       |
| 6  | 28       |
| 8  | 25       |
| 10 | 5        |
| 12 | 0 00029  |
| 4  | 35       |
| 6  | 43       |
| 8  | 52       |
| 20 | 61       |
| 22 | 0 00068  |
| 4  | 73       |
| 6  | 75       |
| 8  | 74       |
| 30 | 69       |
| 32 | 0 00063  |
| 4  | 55       |
| 6  | 46       |
| 8  | 37       |
| 40 | 0 0003   |

C ta t + 0005

| Z  | Equation |
|----|----------|
| 00 | 0 00050  |
| 2  | 55       |
| 4  | 59       |
| 6  | 63       |
| 8  | 64       |
| 10 | 64       |
| 12 | 0 0 062  |
| 4  | 59       |
| 6  | 54       |
| 8  | 49       |
| 20 | 45       |
| 22 | 0 00040  |
| 4  | 38       |
| 6  | 36       |
| 8  | 36       |
| 30 | 38       |
| 32 | 0 00042  |
| 4  | 46       |
| 6  | 51       |
| 8  | 56       |
| 40 | 0 00060  |

C t t + 000

# SATELLITE II

## Tables of Longitude, Latitude, and Radius Vector

XLIV

Equation of Latitude

Argument Q, U

| Q<br>U | 0 <sup>d</sup> .0 | 0 <sup>d</sup> .2 | 0 <sup>d</sup> .4 | 0 <sup>d</sup> .6 | 0 <sup>d</sup> .8 | 1 <sup>d</sup> .0 | 1 <sup>d</sup> .2 | 1 <sup>d</sup> .4 | 1 <sup>d</sup> .6 | 1 <sup>d</sup> .8 | 2 <sup>d</sup> .0 | 2 <sup>d</sup> .2 | 2 <sup>d</sup> .4 | 2 <sup>d</sup> .6 | 2 <sup>d</sup> .8 | 3 <sup>d</sup> .0 | 3 <sup>d</sup> .2 | 3 <sup>d</sup> .4 | 3 <sup>d</sup> .6 | 3 <sup>d</sup> .8 | 4 <sup>d</sup> .0 |
|--------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 0.0    | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                | 50                |
| .2     | 44                | 45                | 49                | 53                | 56                | 56                | 53                | 49                | 45                | 44                | 46                | 50                | 54                | 56                | 55                | 52                | 48                | 45                | 44                | 46                | 50                |
| .4     | 38                | 41                | 48                | 56                | 61                | 61                | 55                | 47                | 41                | 38                | 42                | 49                | 57                | 61                | 60                | 54                | 46                | 40                | 38                | 43                | 50                |
| .6     | 34                | 38                | 48                | 58                | 65                | 64                | 57                | 46                | 37                | 34                | 39                | 49                | 59                | 65                | 64                | 56                | 45                | 36                | 35                | 40                | 50                |
| .8     | 32                | 36                | 47                | 59                | 67                | 66                | 58                | 46                | 36                | 32                | 38                | 49                | 61                | 67                | 66                | 57                | 44                | 35                | 32                | 39                | 50                |
| 1.0    | 32                | 37                | 47                | 59                | 67                | 66                | 58                | 46                | 36                | 32                | 38                | 49                | 60                | 67                | 66                | 56                | 44                | 35                | 33                | 39                | 50                |
| 1.2    | 35                | 38                | 48                | 58                | 65                | 64                | 57                | 46                | 38                | 35                | 39                | 49                | 59                | 65                | 64                | 56                | 45                | 37                | 35                | 40                | 50                |
| .4     | 39                | 42                | 48                | 56                | 61                | 60                | 55                | 47                | 41                | 39                | 42                | 49                | 57                | 61                | 60                | 54                | 46                | 40                | 39                | 43                | 50                |
| .6     | 44                | 46                | 49                | 53                | 55                | 55                | 52                | 49                | 46                | 45                | 46                | 50                | 53                | 55                | 55                | 52                | 48                | 45                | 45                | 46                | 50                |
| .8     | 51                | 51                | 50                | 50                | 49                | 49                | 50                | 50                | 51                | 51                | 51                | 50                | 50                | 49                | 49                | 50                | 50                | 49                | 49                | 49                | 50                |
| 2.0    | 57                | 55                | 51                | 46                | 43                | 44                | 47                | 52                | 56                | 57                | 55                | 50                | 46                | 43                | 44                | 47                | 52                | 56                | 57                | 54                | 50                |
| 2.2    | 62                | 59                | 52                | 44                | 38                | 39                | 44                | 53                | 60                | 62                | 59                | 51                | 43                | 38                | 39                | 45                | 54                | 61                | 62                | 58                | 50                |
| .4     | 66                | 62                | 52                | 42                | 35                | 35                | 43                | 54                | 63                | 66                | 61                | 51                | 40                | 34                | 36                | 44                | 55                | 64                | 66                | 60                | 50                |
| .6     | 68                | 64                | 53                | 41                | 33                | 33                | 42                | 54                | 65                | 68                | 63                | 51                | 39                | 33                | 34                | 43                | 56                | 65                | 68                | 61                | 50                |
| .8     | 68                | 63                | 53                | 41                | 33                | 34                | 42                | 54                | 64                | 67                | 62                | 51                | 40                | 33                | 35                | 44                | 56                | 65                | 67                | 61                | 50                |
| 3.0    | 65                | 61                | 52                | 42                | 36                | 36                | 43                | 54                | 62                | 65                | 60                | 51                | 41                | 35                | 37                | 44                | 55                | 63                | 65                | 59                | 50                |
| 3.2    | 61                | 58                | 52                | 44                | 40                | 40                | 45                | 53                | 59                | 60                | 57                | 51                | 44                | 40                | 41                | 46                | 53                | 59                | 60                | 57                | 50                |
| .4     | 55                | 54                | 51                | 48                | 46                | 46                | 48                | 51                | 54                | 54                | 53                | 50                | 47                | 45                | 46                | 48                | 52                | 54                | 55                | 53                | 50                |
| .6     | 48                | 49                | 50                | 51                | 52                | 52                | 51                | 50                | 49                | 48                | 49                | 50                | 51                | 52                | 51                | 50                | 49                | 49                | 48                | 49                | 50                |
| .8     | 42                | 44                | 49                | 54                | 57                | 57                | 53                | 48                | 44                | 42                | 45                | 49                | 55                | 58                | 57                | 53                | 48                | 43                | 42                | 45                | 50                |
| 4.0    | 37                | 40                | 48                | 57                | 62                | 62                | 56                | 47                | 40                | 37                | 41                | 49                | 58                | 63                | 61                | 55                | 46                | 39                | 37                | 42                | 50                |

The unit in this Table equals 0.00001.

Applied Constant: -0.000050.

XLV

### Occultations and Transits

To correct for the Jovicentric Latitude of the Earth, the Satellite's Latitude as derived from Tables XXXVII-XLIV, must be supplemented by the term—

$$\pm .229003 R_1 \sin (\odot - \Omega) / \Delta \left. \begin{array}{l} + \text{Oc.} \\ - \text{Tr.} \end{array} \right\} (9.359841)$$

where  $R_1$ ,  $\Delta$  are the Geocentric Distances of the Sun and Jupiter respectively, and  $\Omega$  the Ascending Node of Jupiter's Orbit on the Ecliptic, (Table C). For Occultations employ the natural sign, for Transits the reversed sign.

XLVI Sh., Tr.

| 1    | 2                            |
|------|------------------------------|
| Lat. | Corr <sup>n</sup> . Sh., Tr. |
| 0.0  | - .00121                     |
| .1   | 104                          |
| .2   | 87                           |
| .3   | 69                           |
| .4   | 52                           |
| .5   | 35                           |
| 0.6  | - .00018                     |
| .7   | 0                            |
| .8   | + .00018                     |
| .9   | 35                           |
| 1.0  | 52                           |
| 1.1  | + .00069                     |
| .2   | 87                           |
| .3   | 104                          |
| 1.4  | + .00121                     |

This Correction to be applied to Latitude as found from Tables XXXVII-XLV, before using as Argument of Semiduration for Shadows and Transits.

120

XLVII

| 1    | 2          | 3    | 4                |
|------|------------|------|------------------|
| Lat. | Angle      | Lat. | $\Delta$<br>0.01 |
| 0.00 | - 3.9968 + | 1.40 | 569,1            |
| .05  | 3.7121     | .35  | 569,5            |
| .10  | 3.4273     | .30  | 569,9            |
| .15  | 3.1422     | .25  | 570,2            |
| .20  | 2.8571     | .20  | 570,5            |
| .25  | 2.5718     | .15  | 570,7            |
| 0.30 | - 2.2864 + | 1.10 | 571,0            |
| .35  | 2.0008     | .05  | 571,2            |
| .40  | 1.7152     | 1.00 | 571,4            |
| .45  | 1.4294     | 0.95 | 571,6            |
| .50  | 1.1436     | .90  | 571,7            |
| 0.55 | - 0.8577 + | 0.85 | 571,8            |
| .60  | 0.5718     | .80  | 571,8            |
| .65  | - 0.2859 + | .75  | 571,8            |
| 0.70 | 0.0000     | 0.70 | 571,8            |

This Table shows the Angle of the Satellite above Jupiter's Orbit, which corresponds to the Latitude as taken from Tables XXXVII-XLIV.

# SATELLITE II

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## Tables

of the

Synodic Motion,

Duration of the Phenomena of Eclipse,  
Occultation, Transit and Shadow-Transit,

with

Equations for Reduction to the Middle

and the

Light-Curve of Eclipse

# SATELLITE II

## Tables of Synodic Motion

### XLVIII

| 1          | 2            | 1          | 2            | 1          | 2            | 1          | 2            | 1          | 2            |
|------------|--------------|------------|--------------|------------|--------------|------------|--------------|------------|--------------|
| Angle      | Syn. Value   | Angle      | Syn. Value   | Angle      | Syn. Value   | Angle      | Syn. Value   | Angle      | Syn. Value   |
| °<br>0'000 | d<br>'000000 | °<br>0'020 | d<br>'000197 | °<br>0'040 | d<br>'000395 | °<br>0'060 | d<br>'000592 | °<br>0'080 | d<br>'000790 |
| 1          | 10           | 21         | 207          | 41         | 405          | 61         | 602          | 81         | 800          |
| 2          | 20           | 22         | 217          | 42         | 415          | 62         | 612          | 82         | 810          |
| 3          | 30           | 23         | 227          | 43         | 425          | 63         | 622          | 83         | 819          |
| 4          | 39           | 24         | 237          | 44         | 434          | 64         | 632          | 84         | 829          |
| 5          | 49           | 25         | 247          | 45         | 444          | 65         | 642          | 85         | 839          |
| 0'006      | '000059      | 0'026      | '000257      | 0'046      | '000454      | 0'066      | '000652      | 0'086      | '000849      |
| 7          | 69           | 27         | 267          | 47         | 464          | 67         | 661          | 87         | 859          |
| 8          | 79           | 28         | 276          | 48         | 474          | 68         | 671          | 88         | 869          |
| 9          | 89           | 29         | 286          | 49         | 484          | 69         | 681          | 89         | 879          |
| 10         | 99           | 30         | 296          | 50         | 494          | 70         | 691          | 90         | 889          |
| 0'011      | '000109      | 0'031      | '000306      | 0'051      | '000503      | 0'071      | '000701      | 0'091      | '000898      |
| 12         | 118          | 32         | 316          | 52         | 513          | 72         | 711          | 92         | 908          |
| 13         | 128          | 33         | 326          | 53         | 523          | 73         | 721          | 93         | 918          |
| 14         | 138          | 34         | 336          | 54         | 533          | 74         | 731          | 94         | 928          |
| 15         | 148          | 35         | 346          | 55         | 543          | 75         | 740          | 95         | 938          |
| 0'016      | '000158      | 0'036      | '000355      | 0'056      | '000553      | 0'076      | '000750      | 0'096      | '000948      |
| 17         | 168          | 37         | 365          | 57         | 563          | 77         | 760          | 97         | 958          |
| 18         | 178          | 38         | 375          | 58         | 573          | 78         | 770          | 98         | 968          |
| 19         | 188          | 39         | 385          | 59         | 582          | 79         | 780          | 99         | 977          |
| 0'020      | '000197      | 0'040      | '000395      | 0'060      | '000592      | 0'080      | '000790      | 0'100      | '000987      |

### XLIX

| 1        | 2            |
|----------|--------------|
| Angle    | Syn. Value   |
| °<br>0'0 | d<br>'000000 |
| ·1       | 987          |
| ·2       | 1974         |
| ·3       | 2962         |
| ·4       | 3949         |
| ·5       | 4936         |
| 0'6      | '005923      |
| ·7       | 6911         |
| ·8       | 7898         |
| ·9       | 8885         |
| 1'0      | '009872      |

These Tables show the time taken to describe a given angle, with the Mean Synodic Motion. They are to be used for converting into time the Complement or excess of Jupiter's longitude over that of the Satellite at an assumed approximate time of conjunction.

To allow for the *true* Synodic Motion modify the entry of the table by adding to it its product by the Variation as taken from Tables XXXIII-XXXVI.

# SATELLITE II

## Tables of the Phenomena

L

Semiduration

Argument Latitude

| Lat | Ecl Oc              | 3<br>Δ<br>oo | 4<br>Corr<br>Sh T | 5<br>Lat |
|-----|---------------------|--------------|-------------------|----------|
| 000 | <sup>d</sup> 04 411 | 59 0         | - 74              | 1 400    |
| 005 | 4 7 4               | 58 3         | 74                | 395      |
| 010 | 4 994               | 57 6         | 75                | 390      |
| 015 | 43 8                | 56 8         | 75                | 385      |
| 020 | 4356                | 56           | 76                | 380      |
| 025 | 43840               | 55           | 76                | 375      |
| 030 | 044114              | 54 4         | - 77              | 1 370    |
| 035 | 44384               | 53 7         | 77                | 365      |
| 040 | 44651               | 53 1         | 78                | 360      |
| 045 | 44915               | 52 4         | 78                | 355      |
| 050 | 45175               | 51 6         | 79                | 350      |
| 055 | 04543               | 51 0         | - 79              | 1 345    |
| 060 | 45685               | 50 3         | 80                | 340      |
| 065 | 45935               | 49 5         | 80                | 335      |
| 070 | 46181               | 49 0         | 8                 | 330      |
| 075 | 464 4               | 48 4         | 81                | 325      |
| 080 | 046665              | 47 7         | - 81              | 1 320    |
| 085 | 4690                | 47 0         | 82                | 315      |
| 090 | 47135               | 46 4         | 82                | 310      |
| 095 | 47366               | 45 8         | 8                 | 305      |
| 100 | 47593               | 45 2         | 83                | 300      |
| 105 | 047818              | 44 7         | - 83              | 1 295    |
| 110 | 48040               | 44 1         | 83                | 290      |
| 115 | 48 59               | 43 5         | 84                | 285      |
| 120 | 48475               | 43 0         | 84                | 280      |
| 125 | 48689               | 4 5          | 85                | 275      |
| 130 | 048900              | 41 9         | - 85              | 1 270    |
| 135 | 49108               | 41 4         | 85                | 265      |
| 140 | 49314               | 40 8         | 86                | 260      |
| 145 | 495 7               | 40 2         | 86                | 255      |
| 150 | 49716               | 39 7         | 86                | 250      |
| 155 | 049914              | 39 3         | - 87              | 1 245    |
| 160 | 5 109               | 38 7         | 87                | 240      |
| 165 | 5 3 2               | 38           | 88                | 235      |
| 170 | 50491               | 37 7         | 88                | 230      |
| 175 | 5 679               | 37 3         | 88                | 225      |
| 180 | 05 864              | 36 7         | - 89              | 1 220    |
| 185 | 51046               | 36 2         | 89                | 215      |
| 190 | 51 6                | 35 8         | 89                | 210      |
| 195 | 51404               | 35 4         | 89                | 205      |
| 200 | 51580               | 34 8         | 90                | 200      |
| 205 | 051753              | 34 3         | - 90              | 1 195    |
| 210 | 519 3               | 33 9         | 90                | 190      |
| 215 | 5 09                | 33 5         | 91                | 185      |
| 220 | 5 58                | 33 0         | 91                | 180      |
| 225 | 524 2               | 3 6          | 91                | 175      |
| 230 | 05 584              | 32 1         | - 9               | 1 170    |
| 235 | 5 744               | 31           | 9                 | 165      |
| 240 | 52901               | 31 3         | 9                 | 160      |
| 245 | 53056               | 30 9         | 9                 | 155      |
| 250 | 053 10              | 30 4         | - 93              | 1 150    |

| L t | Ecl Oc              | 3<br>Δ<br>oo | 4<br>Corr<br>SI T | 5<br>Lat |
|-----|---------------------|--------------|-------------------|----------|
| 250 | <sup>d</sup> 053210 | 30 4         | - 93              | 1 150    |
| 255 | 53360               | 3 0          | 93                | 145      |
| 260 | 5351                | 9 5          | 93                | 140      |
| 265 | 53656               | 9 1          | 93                | 135      |
| 270 | 53801               | 8 7          | 94                | 130      |
| 275 | 53944               | 8 3          | 94                | 125      |
| 280 | 054084              | 7 9          | - 94              | 1 120    |
| 285 | 54 23               | 7 6          | 94                | 115      |
| 290 | 54360               | 7            | 95                | 110      |
| 295 | 54495               | 6 8          | 95                | 105      |
| 300 | 54628               | 26 3         | 95                | 100      |
| 305 | 054758              | 25 9         | - 95              | 1 095    |
| 310 | 54887               | 5 5          | 96                | 090      |
| 315 | 55014               | 25 2         | 96                | 085      |
| 320 | 55139               | 24 8         | 96                | 080      |
| 325 | 55 62               | 24 4         | 96                | 075      |
| 330 | 055383              | 24 0         | - 96              | 1 070    |
| 335 | 5550                | 23 6         | 97                | 065      |
| 340 | 55619               | 23           | 97                | 060      |
| 345 | 55735               | 22 9         | 97                | 055      |
| 350 | 55848               | 22 6         | 97                | 050      |
| 355 | 055960              | 22 3         | - 97              | 1 045    |
| 360 | 56071               | 1 8          | 98                | 040      |
| 365 | 56179               | 21 4         | 98                | 035      |
| 370 | 56 85               | 21 1         | 98                | 030      |
| 375 | 5639                | 20 8         | 98                | 025      |
| 380 | 056493              | 20 4         | - 98              | 1 020    |
| 385 | 56594               | 0 0          | 98                | 015      |
| 390 | 56693               | 19 6         | 99                | 010      |
| 395 | 56791               | 19 3         | 99                | 005      |
| 400 | 56886               | 19 0         | 99                | 1 000    |
| 405 | 056981              | 18 7         | - 99              | 0 995    |
| 410 | 57073               | 18 3         | 99                | 990      |
| 415 | 57164               | 17 9         | 100               | 985      |
| 420 | 5725                | 17 6         | 100               | 980      |
| 425 | 57340               | 17 3         | 100               | 975      |
| 430 | 057425              | 16 9         | - 100             | 0 970    |
| 435 | 57509               | 16 6         | 100               | 965      |
| 440 | 57591               | 16 2         | 100               | 960      |
| 445 | 57671               | 15 9         | 100               | 955      |
| 450 | 57750               | 15 6         | 101               | 950      |
| 455 | 0578 7              | 15 3         | - 101             | 0 945    |
| 460 | 57903               | 14 9         | 101               | 940      |
| 465 | 57977               | 14 6         | 101               | 935      |
| 470 | 58049               | 14 2         | 101               | 930      |
| 475 | 58119               | 13 9         | 101               | 925      |
| 480 | 058188              | 13 6         | - 101             | 0 920    |
| 485 | 58256               | 13 3         | 101               | 915      |
| 490 | 58321               | 13 0         | 101               | 910      |
| 495 | 58385               | 12 7         | 102               | 905      |
| 500 | 058448              | 12 3         | - 102             | 0 900    |

| Lat | Ecl Oc  | 3<br>Δ<br>oor | 4<br>Corr<br>Sh T | 5<br>Lat |
|-----|---------|---------------|-------------------|----------|
| 500 | 0 58448 | 1 3           | - 102             | 900      |
| 505 | 58508   | 11 9          | 10                | 895      |
| 510 | 58567   | 11 6          | 10                | 890      |
| 515 | 586 6   | 11 4          | 102               | 885      |
| 520 | 58681   | 11 1          | 102               | 880      |
| 525 | 58736   | 10 8          | 1                 | 875      |
| 530 | 058789  | 10 4          | - 102             | 870      |
| 535 | 58840   | 10 0          | 102               | 865      |
| 540 | 58889   | 9 7           | 102               | 860      |
| 545 | 58938   | 9 5           | 102               | 855      |
| 550 | 58984   | 9             | 103               | 850      |
| 555 | 059029  | 8 9           | - 103             | 845      |
| 560 | 59073   | 8 5           | 103               | 840      |
| 565 | 59114   | 8 1           | 103               | 835      |
| 570 | 59154   | 7 9           | 103               | 830      |
| 575 | 59194   | 7 7           | 103               | 825      |
| 580 | 059231  | 7 4           | - 103             | 820      |
| 585 | 59 67   | 7 0           | 103               | 815      |
| 590 | 59301   | 6 7           | 103               | 810      |
| 595 | 59333   | 6 4           | 103               | 805      |
| 600 | 59365   | 6 1           | 103               | 800      |
| 605 | 059394  | 5 7           | - 103             | 795      |
| 610 | 59422   | 5 4           | 103               | 790      |
| 615 | 59449   | 5 1           | 103               | 785      |
| 620 | 59473   | 4 8           | 104               | 780      |
| 625 | 59497   | 4 5           | 104               | 775      |
| 630 | 059518  | 4 3           | - 104             | 770      |
| 635 | 59539   | 4 0           | 104               | 765      |
| 640 | 59558   | 3 7           | 104               | 760      |
| 645 | 59576   | 3 4           | 104               | 755      |
| 650 | 5959    | 3 0           | 104               | 750      |
| 655 | 059606  | 2 7           | - 104             | 745      |
| 660 | 59619   | 2 4           | 104               | 740      |
| 665 | 59630   | 2 1           | 104               | 735      |
| 670 | 59640   | 1 8           | 104               | 730      |
| 675 | 59648   | 1 5           | 104               | 725      |
| 680 | 059655  | 1 2           | - 104             | 720      |
| 685 | 59660   | 0 9           | 104               | 715      |
| 690 | 59664   | 0 6           | 104               | 710      |
| 695 | 59666   | 0 3           | 104               | 705      |
| 700 | 059667  | 0 0           | - 104             | 700      |

LI Equation of Semiduration

| a              | Ecl Oc                | a                 | Ecl Oc                 |
|----------------|-----------------------|-------------------|------------------------|
| <sup>d</sup> 0 | <sup>d</sup> +0 00007 | <sup>d</sup> 2500 | <sup>d</sup> -0 000006 |
| 500            | +                     | 3000              | -                      |
| 1000           | +                     | 3500              | +                      |
| 1500           | -                     | 4000              | +                      |
| 2000           | -0 000007             | 4500              | +0 000007              |

Appl dC t t oo oo Th Argum t t t L t t d d l d f m T b l XXXVII XLVI F Sh d w d  
T t th rr t l C l m t b p p l d t th t y l C l Th try m t b rr t d furth by th  
Eq t l f T b l L I L V I F Sh d w d T it it m t l b rr t d f J p l t Ph by T b l L X V I

N C t th b d d d

# SATELLITE II

## Tables of the Phenomena

LII

| 1        | 2              |
|----------|----------------|
| $\beta$  | E., O., S., T. |
| $\alpha$ | $\alpha$       |
| 0        | 0'000010       |
| 20       | 12             |
| 40       | 13             |
| 60       | 14             |
| 80       | 15             |
| 100      | 15             |
| 120      | 0'000015       |
| 140      | 14             |
| 160      | 13             |
| 180      | 12             |
| 200      | 10             |
| 220      | 0'000008       |
| 240      | 7              |
| 260      | 6              |
| 280      | 5              |
| 300      | 5              |
| 320      | 0'000005       |
| 340      | 6              |
| 360      | 7              |
| 380      | 8              |
| 400      | 0'000010       |

Constant:  $\pm 0^d.000000$ .

Equations of Semiduration

| Lat.     | '00      | '10      | '20      | '30      | '40      | '50      | '60      | '70      |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| $\beta$  | 1'40     | 1'30     | 1'20     | 1'10     | 1'00     | '90      | '80      | '70      |
| $\alpha$ |          |          |          |          |          |          |          |          |
| 0        | $\pm 14$ | $\pm 13$ | $\pm 12$ | $\pm 11$ | $\pm 10$ | $\pm 10$ | $\pm 10$ | $\pm 10$ |
| 20       | 14       | 13       | 12       | 11       | 10       | 10       | 10       | 10       |
| 40       | 11       | 10       | 9        | 9        | 8        | 8        | 8        | 8        |
| 60       | 8        | 8        | 7        | 7        | 6        | 6        | 6        | 6        |
| 80       | $\pm 4$  | $\pm 4$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 3$  |
| 100      | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| 120      | $\mp 4$  | $\mp 4$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  |
| 140      | 8        | 8        | 7        | 7        | 6        | 6        | 6        | 6        |
| 160      | 11       | 10       | 9        | 9        | 8        | 8        | 8        | 8        |
| 180      | 14       | 13       | 12       | 11       | 10       | 10       | 10       | 10       |
| 200      | 14       | 13       | 12       | 11       | 10       | 10       | 10       | 10       |
| 220      | $\mp 13$ | $\mp 11$ | $\mp 10$ | $\mp 10$ | $\mp 9$  | $\mp 9$  | $\mp 9$  | $\mp 9$  |
| 240      | 11       | 10       | 9        | 9        | 8        | 8        | 8        | 8        |
| 260      | 8        | 8        | 7        | 7        | 6        | 6        | 6        | 6        |
| 280      | $\mp 4$  | $\mp 4$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  | $\mp 3$  |
| 300      | 0        | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| 320      | $\pm 4$  | $\pm 4$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 3$  | $\pm 3$  |
| 340      | 8        | 8        | 7        | 7        | 6        | 6        | 6        | 6        |
| 360      | 11       | 10       | 9        | 9        | 8        | 8        | 8        | 8        |
| 380      | 14       | 13       | 12       | 11       | 10       | 10       | 10       | 10       |
| 400      | $\pm 14$ | $\pm 13$ | $\pm 12$ | $\pm 11$ | $\pm 10$ | $\pm 10$ | $\pm 10$ | $\pm 10$ |

No Constant has been added. The unit is  $0^d.000000$ . The upper sign applies for Occultations, and the lower for Transits.

LIV

Ecl., Oc.

| U        | 0 <sup>d.0</sup> | 0 <sup>d.2</sup> | 0 <sup>d.4</sup> | 0 <sup>d.6</sup> | 0 <sup>d.8</sup> | 1 <sup>d.0</sup> | 1 <sup>d.2</sup> | 1 <sup>d.4</sup> | 1 <sup>d.6</sup> | 1 <sup>d.8</sup> | 2 <sup>d.0</sup> | 2 <sup>d.2</sup> | 2 <sup>d.4</sup> | 2 <sup>d.6</sup> | 2 <sup>d.8</sup> | 3 <sup>d.0</sup> | 3 <sup>d.2</sup> | 3 <sup>d.4</sup> | 3 <sup>d.6</sup> | 3 <sup>d.8</sup> | 4 <sup>d.0</sup> |
|----------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| $\alpha$ |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| 0.0      | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               |
| 0.2      | 63               | 64               | 64               | 65               | 65               | 64               | 64               | 63               | 62               | 61               | 61               | 60               | 60               | 60               | 60               | 61               | 61               | 62               | 63               | 64               | 65               |
| 0.4      | 68               | 69               | 70               | 70               | 70               | 69               | 68               | 66               | 65               | 63               | 62               | 61               | 61               | 62               | 63               | 64               | 66               | 67               | 68               | 69               | 70               |
| 0.6      | 69               | 70               | 70               | 71               | 70               | 69               | 68               | 66               | 64               | 63               | 62               | 62               | 61               | 62               | 63               | 65               | 66               | 68               | 69               | 70               | 71               |
| 0.8      | 66               | 67               | 67               | 68               | 68               | 67               | 67               | 66               | 64               | 63               | 62               | 62               | 61               | 61               | 62               | 63               | 64               | 65               | 66               | 67               | 67               |
| 1.0      | 63               | 64               | 66               | 67               | 67               | 68               | 68               | 67               | 66               | 66               | 64               | 63               | 62               | 61               | 61               | 61               | 62               | 62               | 64               | 65               | 66               |
| 1.2      | 63               | 64               | 66               | 68               | 69               | 70               | 71               | 71               | 70               | 69               | 67               | 66               | 64               | 63               | 61               | 61               | 61               | 62               | 63               | 65               | 67               |
| 1.4      | 63               | 64               | 66               | 67               | 68               | 69               | 70               | 69               | 69               | 67               | 66               | 64               | 63               | 62               | 61               | 61               | 61               | 62               | 63               | 64               | 66               |
| 1.6      | 61               | 62               | 63               | 64               | 64               | 64               | 64               | 64               | 63               | 63               | 62               | 61               | 60               | 59               | 59               | 59               | 60               | 60               | 61               | 62               | 63               |
| 1.8      | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 60               | 61               | 61               | 61               | 60               | 60               | 60               | 60               | 60               | 60               |
| 2.0      | 61               | 60               | 60               | 59               | 59               | 60               | 61               | 62               | 63               | 64               | 65               | 66               | 66               | 66               | 65               | 64               | 63               | 62               | 61               | 60               | 60               |
| 2.2      | 63               | 62               | 61               | 61               | 62               | 63               | 64               | 66               | 67               | 69               | 70               | 70               | 70               | 70               | 69               | 67               | 66               | 64               | 63               | 62               | 61               |
| 2.4      | 63               | 62               | 61               | 61               | 62               | 63               | 64               | 66               | 67               | 69               | 70               | 70               | 70               | 70               | 69               | 67               | 65               | 64               | 63               | 62               | 61               |
| 2.6      | 64               | 62               | 62               | 61               | 61               | 62               | 62               | 63               | 64               | 65               | 66               | 67               | 67               | 67               | 67               | 66               | 65               | 64               | 63               | 62               | 62               |
| 2.8      | 66               | 65               | 64               | 63               | 62               | 61               | 61               | 62               | 62               | 63               | 64               | 66               | 67               | 68               | 68               | 68               | 68               | 67               | 66               | 65               | 64               |
| 3.0      | 69               | 68               | 66               | 65               | 63               | 62               | 61               | 61               | 62               | 63               | 65               | 67               | 68               | 70               | 71               | 71               | 71               | 70               | 69               | 68               | 66               |
| 3.2      | 67               | 66               | 64               | 63               | 62               | 61               | 60               | 61               | 62               | 63               | 64               | 66               | 67               | 68               | 69               | 69               | 69               | 68               | 67               | 66               | 64               |
| 3.4      | 62               | 61               | 60               | 60               | 59               | 59               | 59               | 60               | 60               | 61               | 62               | 63               | 63               | 63               | 63               | 63               | 63               | 62               | 62               | 61               | 60               |
| 3.6      | 60               | 61               | 61               | 61               | 61               | 61               | 61               | 61               | 60               | 60               | 60               | 59               | 59               | 59               | 59               | 59               | 60               | 60               | 60               | 61               | 61               |
| 3.8      | 64               | 65               | 66               | 66               | 66               | 66               | 65               | 64               | 63               | 62               | 61               | 60               | 60               | 60               | 60               | 61               | 62               | 63               | 65               | 65               | 66               |
| 4.0      | 69               | 70               | 71               | 71               | 71               | 70               | 68               | 67               | 65               | 63               | 62               | 62               | 61               | 62               | 63               | 65               | 66               | 68               | 69               | 70               | 71               |

Applied Constant:  $\pm 60$ . The unit in this Table equals  $0^d.000000$ .

# SATELLITE II

## Tables of the Phenomena

LV

Equation of Semiduration

Sh, Tr

| U<br>Q  | 0 <sup>d</sup> 0 0 <sup>d</sup> 2 0 <sup>d</sup> 4 | 0 <sup>d</sup> 6 0 <sup>d</sup> 8 1 <sup>d</sup> 0 | 1 <sup>d</sup> 2 1 <sup>d</sup> 4 1 <sup>d</sup> 6 | 1 <sup>d</sup> 8 2 <sup>d</sup> 0 2 <sup>d</sup> 2 | 2 <sup>d</sup> 4 2 <sup>d</sup> 6 2 <sup>d</sup> 8 | 3 <sup>d</sup> 0 3 <sup>d</sup> 2 3 <sup>d</sup> 4 | 3 <sup>d</sup> 6 3 <sup>d</sup> 8 4 <sup>d</sup> 0 |
|---------|--|--|--|--|--|--|--|
| a<br>00 | 0 1  | 4 7 10   | 1 14 15  | 16 15 14   | 12 9 6   | 3 1 0  | 0 1 2  |
| 1       | 3 4 6  | 8 11 13  | 13 15 18   | 18 17 15   | 1 10 7   | 5 4 3  | 3 5 6  |
| 2       | 11 1 14  | 16 19 21   | 23 4 4   | 24 23 21   | 19 16 13   | 12 10 10   | 11 13 15   |
| 3       | 2 3 25   | 27 30 31   | 33 33 33   | 33 31 9  | 7 5 23   | 2 21 21  | 2 4 26   |
| 4       | 34 35 37   | 39 41 42   | 43 43 43   | 41 4 38  | 36 35 34   | 33 33 33   | 34 36 38   |
| 5       | 46 47 48   | 49 51 5  | 52 51 51   | 49 48 46   | 45 44 43   | 43 44 45   | 46 47 48   |
| 06      | 54 55 56   | 57 58 59   | 59 58 57   | 56 55 54   | 52 51 51   | 52 52 53   | 54 55 57   |
| 7       | 61 62 6  | 63 64 64   | 64 6 62  | 61 60 58   | 57 58 58   | 58 58 60   | 61 62 62   |
| 8       | 64 65 65   | 66 67 67   | 67 66 64   | 63 62 62   | 61 60 61   | 61 62 63   | 64 65 65   |
| 9       | 64 65 66   | 67 67 67   | 67 66 65   | 64 63 62   | 61 61 61   | 62 62 63   | 64 65 66   |
| 10      | 63 64 65   | 66 66 66   | 65 64 63   | 62 61 60   | 60 60 60   | 60 61 62   | 63 64 65   |
| 11      | 60 61 62   | 62 62 62   | 62 61 60   | 59 57 57   | 56 56 56   | 56 57 59   | 60 61 62   |
| 2       | 54 55 56   | 57 57 56   | 56 55 53   | 52 50 50   | 49 50 50   | 51 52 53   | 54 56 57   |
| 3       | 47 49 50   | 50 50 49   | 47 46 44   | 43 41 41   | 41 41 42   | 43 45 47   | 48 49 50   |
| 4       | 39 40 40   | 40 39 37   | 36 34 33   | 31 30 9  | 30 31 32   | 34 36 38   | 39 39 40   |
| 5       | 30 30 30   | 29 28 26   | 24 22 20   | 19 18 19   | 19 21 2  | 25 27 29   | 30 30 31   |
| 16      | 2 22 2   | 21 19 16   | 14 12 10   | 9 9 9  | 10 12 14   | 17 20 21   | 22 2 22  |
| 7       | 17 17 16   | 14 1 9   | 6 4  | 1 2 3  | 4 7 10   | 12 15 17   | 18 17 15   |
| 8       | 16 15 14   | 12 9 6   | 4 2 0  | 0 1 2  | 5 8 11   | 13 15 16   | 16 15 14   |
| 9       | 0 18 17  | 14 11 8  | 7 5 4  | 4 6 7  | 10 13 15   | 17 19 19   | 19 18 15   |
| 20      | 25 24 2  | 19 17 15   | 14 13 13   | 14 15 17   | 20 24  | 25 6 26  | 25 24 22   |
| 21      | 35 32 31   | 29 27 25   | 4 24 24  | 25 27 29   | 31 33 35   | 36 35 35   | 34 32 31   |
| 2       | 43 42 40   | 38 37 36   | 35 36 36   | 37 39 40   | 42 44 45   | 45 45 44   | 43 41 39   |
| 3       | 51 50 48   | 47 46 45   | 46 46 47   | 48 50 51   | 5 53 53  | 54 53 52   | 51 49 48   |
| 4       | 57 56 54   | 53 53 53   | 53 54 55   | 56 57 58   | 59 60 60   | 60 59 58   | 57 56 54   |
| 5       | 61 60 59   | 58 58 58   | 58 59 60   | 61 62 63   | 64 64 65   | 64 63 62   | 61 59 59   |
| 26      | 64 63 62   | 61 61 61   | 61 62 63   | 64 65 66   | 66 66 67   | 66 65 64   | 63 62 62   |
| 7       | 64 63 6  | 62 61 61   | 61 6 63  | 64 65 66   | 67 67 67   | 66 65 64   | 63 62 61   |
| 8       | 61 61 60   | 59 59 59   | 59 61 61   | 62 63 65   | 65 66 65   | 64 64 63   | 62 61 60   |
| 9       | 57 56 55   | 55 54 55   | 55 56 58   | 59 59 61   | 62 62 62   | 61 60 58   | 57 56 55   |
| 30      | 50 49 48   | 48 48 48   | 49 50 52   | 53 54 55   | 55 56 55   | 54 53 51   | 50 49 48   |
| 31      | 4 39 38  | 38 39 40   | 41 43 44   | 46 47 48   | 48 47 46   | 45 43 41   | 40 39 38   |
| 2       | 28 27 6  | 7 28 30  | 31 33 36   | 37 37 38   | 37 36 35   | 33 31 29   | 28 27 27   |
| 3       | 18 17 17   | 18 19 21   | 23 25 27   | 28 29 29   | 8 27 25  | 23 20 18   | 17 17 16   |
| 4       | 6 6 6  | 8 10 13  | 15 18 19   | 1 21 21  | 19 16 13   | 11 9 7   | 6 6 7  |
| 5       | 0 1  | 4 6 9  | 12 15 16   | 16 17 15   | 13 10 8  | 5 3 1  | 0 1 3  |
| 36      | 0 2 3  | 6 8 11   | 14 16 16   | 16 16 13   | 11 8 6   | 3 2 1  | 1 2 3  |
| 7       | 6 7 9  | 11 14 16   | 19 2 1   | 21 19 17   | 15 12 9  | 8 6 6  | 6 8 10   |
| 8       | 15 17 19   | 21 3 26  | 7 8 28   | 8 26 24  | 2 19 17  | 16 15 15   | 16 17 20   |
| 9       | 8 29 31  | 33 35 37   | 38 38 37   | 36 35 33   | 31 29 28   | 27 6 27  | 28 29 3  |
| 40      | 40 41 43   | 45 46 47   | 47 48 47   | 45 44 42   | 40 39 38   | 38 38 39   | 40 41 43   |

Appli d C t t + 6 Th it in thi T bl q al oooo



# SATELLITE II

## Tables of the Phenomena

LVI

Equation of Semiduration

Ec., Oc., Sh., Tr.

| Lat.<br>Var. | '00  | '02  | '04  | '06  | '08  | '10  | '12  | '14  | '16  | '18  | '20  | '22  | '24  | '26  | '28  | '30  | '32  | '34  | '36  |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|              | 1'40 | 1'38 | 1'36 | 1'34 | 1'32 | 1'30 | 1'28 | 1'26 | 1'24 | 1'22 | 1'20 | 1'18 | 1'16 | 1'14 | 1'12 | 1'10 | 1'08 | 1'06 | 1'04 |
| - '020       | 618  | 572  | 531  | 492  | 456  | 422  | 391  | 361  | 334  | 308  | 284  | 261  | 240  | 220  | 201  | 184  | 167  | 152  | 138  |
| 19           | 619  | 575  | 536  | 499  | 465  | 432  | 403  | 374  | 349  | 324  | 301  | 279  | 260  | 240  | 223  | 206  | 190  | 176  | 163  |
| 18           | 619  | 578  | 541  | 506  | 473  | 443  | 414  | 387  | 363  | 340  | 319  | 298  | 279  | 261  | 244  | 228  | 214  | 200  | 187  |
| 17           | 620  | 581  | 546  | 513  | 482  | 453  | 426  | 401  | 378  | 356  | 336  | 316  | 299  | 281  | 266  | 250  | 237  | 224  | 212  |
| 16           | 620  | 584  | 550  | 520  | 491  | 464  | 439  | 415  | 393  | 373  | 353  | 335  | 318  | 302  | 287  | 273  | 260  | 248  | 237  |
| 15           | 621  | 587  | 555  | 527  | 500  | 474  | 451  | 428  | 408  | 389  | 370  | 353  | 338  | 322  | 309  | 295  | 283  | 272  | 262  |
| - '014       | 622  | 589  | 560  | 533  | 508  | 484  | 462  | 442  | 423  | 405  | 388  | 372  | 357  | 343  | 330  | 318  | 306  | 296  | 286  |
| 13           | 622  | 592  | 565  | 540  | 517  | 494  | 473  | 455  | 438  | 421  | 405  | 390  | 377  | 363  | 352  | 340  | 329  | 320  | 311  |
| 12           | 623  | 595  | 570  | 547  | 525  | 505  | 486  | 469  | 452  | 437  | 422  | 408  | 396  | 384  | 373  | 362  | 352  | 343  | 335  |
| 11           | 624  | 598  | 575  | 554  | 534  | 515  | 498  | 482  | 467  | 453  | 439  | 427  | 416  | 404  | 395  | 384  | 375  | 367  | 360  |
| 10           | 624  | 601  | 580  | 561  | 543  | 526  | 511  | 496  | 482  | 469  | 457  | 446  | 435  | 425  | 416  | 407  | 399  | 392  | 384  |
| - '009       | 625  | 604  | 585  | 568  | 552  | 536  | 523  | 509  | 497  | 485  | 474  | 464  | 455  | 445  | 438  | 429  | 422  | 416  | 409  |
| 8            | 625  | 607  | 590  | 575  | 560  | 547  | 534  | 523  | 512  | 501  | 492  | 483  | 474  | 466  | 459  | 452  | 445  | 439  | 433  |
| 7            | 626  | 610  | 595  | 582  | 569  | 558  | 546  | 536  | 527  | 517  | 509  | 501  | 494  | 486  | 480  | 474  | 468  | 463  | 458  |
| 6            | 626  | 613  | 600  | 589  | 578  | 568  | 558  | 549  | 541  | 533  | 526  | 519  | 513  | 507  | 501  | 496  | 491  | 487  | 482  |
| 5            | 627  | 616  | 605  | 596  | 587  | 578  | 570  | 562  | 556  | 549  | 543  | 537  | 533  | 527  | 523  | 518  | 514  | 511  | 507  |
| - '004       | 628  | 618  | 610  | 602  | 595  | 588  | 582  | 576  | 571  | 565  | 561  | 556  | 552  | 548  | 544  | 540  | 537  | 534  | 531  |
| 3            | 629  | 621  | 615  | 609  | 604  | 598  | 594  | 589  | 586  | 581  | 578  | 574  | 572  | 568  | 566  | 563  | 560  | 558  | 556  |
| 2            | 629  | 624  | 620  | 616  | 613  | 609  | 606  | 603  | 601  | 598  | 596  | 593  | 591  | 589  | 587  | 586  | 584  | 582  | 581  |
| - '001       | 630  | 627  | 625  | 623  | 622  | 619  | 618  | 616  | 616  | 614  | 613  | 611  | 611  | 609  | 609  | 608  | 607  | 606  | 606  |
| 0            | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  |
| + '001       | 631  | 633  | 635  | 637  | 639  | 640  | 642  | 643  | 645  | 646  | 647  | 648  | 650  | 650  | 652  | 652  | 653  | 654  | 655  |
| 2            | 631  | 636  | 640  | 644  | 647  | 651  | 654  | 657  | 659  | 662  | 664  | 667  | 669  | 671  | 673  | 674  | 676  | 678  | 679  |
| 3            | 632  | 639  | 645  | 651  | 656  | 661  | 666  | 670  | 674  | 678  | 681  | 685  | 689  | 691  | 695  | 697  | 699  | 702  | 704  |
| 4            | 632  | 642  | 650  | 658  | 665  | 672  | 678  | 684  | 689  | 695  | 699  | 704  | 708  | 712  | 716  | 720  | 723  | 726  | 729  |
| 5            | 633  | 645  | 655  | 665  | 674  | 682  | 690  | 697  | 704  | 711  | 716  | 722  | 728  | 732  | 738  | 742  | 746  | 750  | 754  |
| + '006       | 634  | 647  | 660  | 671  | 682  | 692  | 702  | 711  | 719  | 727  | 734  | 741  | 747  | 753  | 759  | 764  | 769  | 773  | 778  |
| 7            | 635  | 650  | 665  | 678  | 691  | 702  | 714  | 724  | 734  | 743  | 751  | 759  | 766  | 773  | 780  | 786  | 792  | 797  | 803  |
| 8            | 635  | 653  | 670  | 685  | 700  | 713  | 726  | 737  | 748  | 759  | 768  | 777  | 786  | 794  | 801  | 808  | 815  | 821  | 827  |
| 9            | 636  | 656  | 675  | 692  | 709  | 723  | 738  | 750  | 763  | 775  | 785  | 795  | 806  | 814  | 823  | 830  | 838  | 845  | 852  |
| 10           | 636  | 659  | 680  | 699  | 717  | 734  | 749  | 764  | 778  | 791  | 803  | 814  | 825  | 835  | 844  | 853  | 861  | 868  | 876  |
| + '011       | 637  | 662  | 685  | 706  | 726  | 744  | 761  | 777  | 793  | 806  | 820  | 833  | 845  | 855  | 866  | 875  | 884  | 892  | 901  |
| 12           | 637  | 665  | 690  | 713  | 735  | 755  | 774  | 791  | 808  | 823  | 838  | 852  | 864  | 876  | 887  | 898  | 908  | 917  | 925  |
| 13           | 638  | 668  | 695  | 720  | 744  | 765  | 786  | 804  | 823  | 840  | 855  | 870  | 884  | 896  | 909  | 920  | 931  | 941  | 950  |
| 14           | 638  | 671  | 700  | 727  | 752  | 776  | 798  | 818  | 837  | 855  | 872  | 888  | 903  | 917  | 930  | 942  | 954  | 964  | 974  |
| 15           | 639  | 674  | 705  | 733  | 761  | 786  | 810  | 832  | 852  | 871  | 889  | 906  | 923  | 937  | 952  | 964  | 977  | 988  | 999  |
| + '016       | 640  | 676  | 710  | 740  | 769  | 796  | 821  | 845  | 867  | 887  | 907  | 925  | 942  | 958  | 973  | 987  | 1000 | 1012 | 1023 |
| 17           | 641  | 679  | 715  | 747  | 778  | 806  | 833  | 859  | 882  | 903  | 924  | 943  | 962  | 978  | 995  | 1009 | 1023 | 1036 | 1048 |
| 18           | 641  | 682  | 719  | 754  | 787  | 817  | 846  | 873  | 897  | 920  | 941  | 962  | 981  | 999  | 1016 | 1032 | 1046 | 1060 | 1073 |
| 19           | 642  | 685  | 724  | 761  | 796  | 827  | 858  | 886  | 912  | 936  | 958  | 980  | 1001 | 1019 | 1038 | 1054 | 1069 | 1084 | 1098 |
| + '020       | 642  | 688  | 729  | 768  | 804  | 838  | 869  | 899  | 926  | 952  | 976  | 999  | 1020 | 1040 | 1059 | 1076 | 1093 | 1108 | 1122 |

Applied Constant: +0<sup>d</sup>.000630. The unit in this Table is equal to 0<sup>d</sup>.000001. The Arguments of this Table are the Variation, as taken from Tables XXXIII-XXXVI, and the Latitude, from Tables XXXVII-XLVI.

# SATELLITE II

## Tables of the Phenomena

LVI *continued*

Equation of Semiduration

Ec, Oc, Sh, Tr

| L t<br>Var | 36   | 38   | 40   | 42   | 44   | 46   | 48   | 50   | 52   | 54   | 56   | 58   | 60   | 62   | 64   | 66   | 68   | 70   |
|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|            | 1 04 | 1 02 | 1 00 | 98   | 96   | 94   | 92   | 90   | 88   | 86   | 84   | 82   | 80   | 78   | 76   | 74   | 72   |      |
| - 020      | 138  | 125  | 11   | 101  | 90   | 81   | 7    | 64   | 57   | 51   | 45   | 40   | 36   | 33   | 31   | 28   | 7    | 27   |
| 19         | 163  | 150  | 138  | 127  | 117  | 108  | 100  | 92   | 86   | 80   | 74   | 70   | 66   | 63   | 61   | 58   | 57   | 57   |
| 18         | 187  | 175  | 164  | 153  | 144  | 135  | 118  | 120  | 114  | 118  | 103  | 99   | 95   | 92   | 90   | 88   | 87   | 87   |
| 17         | 1    | 200  | 190  | 180  | 171  | 163  | 156  | 148  | 143  | 137  | 132  | 119  | 115  | 112  | 110  | 118  | 117  | 117  |
| 16         | 37   | 6    | 16   | 207  | 199  | 191  | 184  | 177  | 17   | 167  | 16   | 159  | 155  | 153  | 151  | 149  | 148  | 148  |
| 15         | 6    | 51   | 242  | 33   | 26   | 18   | 21   | 205  | 201  | 196  | 191  | 188  | 185  | 183  | 181  | 179  | 178  | 178  |
| - 014      | 86   | 76   | 68   | 259  | 5    | 246  | 240  | 234  | 9    | 224  | 21   | 217  | 214  | 212  | 211  | 209  | 208  | 8    |
| 13         | 311  | 31   | 294  | 85   | 79   | 73   | 268  | 6    | 58   | 53   | 50   | 46   | 244  | 42   | 41   | 239  | 238  | 38   |
| 12         | 335  | 37   | 319  | 31   | 36   | 30   | 295  | 90   | 286  | 282  | 279  | 76   | 273  | 272  | 270  | 269  | 268  | 268  |
| 11         | 36   | 35   | 345  | 338  | 333  | 328  | 33   | 318  | 315  | 311  | 308  | 36   | 303  | 302  | 300  | 299  | 298  | 298  |
| 10         | 384  | 378  | 371  | 366  | 361  | 356  | 35   | 347  | 344  | 341  | 338  | 336  | 334  | 332  | 331  | 330  | 39   | 329  |
| - 009      | 409  | 403  | 397  | 392  | 388  | 383  | 380  | 375  | 373  | 370  | 367  | 365  | 364  | 362  | 361  | 360  | 359  | 359  |
| 8          | 433  | 48   | 43   | 418  | 414  | 410  | 407  | 404  | 401  | 398  | 396  | 394  | 393  | 391  | 390  | 389  | 389  | 389  |
| 7          | 458  | 453  | 459  | 444  | 441  | 437  | 435  | 43   | 430  | 427  | 425  | 423  | 423  | 421  | 40   | 419  | 419  | 419  |
| 6          | 482  | 478  | 475  | 471  | 468  | 465  | 463  | 460  | 458  | 456  | 454  | 453  | 452  | 451  | 450  | 449  | 449  | 449  |
| 5          | 507  | 503  | 501  | 497  | 495  | 49   | 491  | 488  | 487  | 485  | 483  | 482  | 482  | 481  | 480  | 479  | 479  | 479  |
| - 004      | 531  | 59   | 526  | 54   | 522  | 52   | 518  | 516  | 515  | 514  | 513  | 512  | 511  | 510  | 510  | 509  | 509  | 59   |
| 3          | 556  | 554  | 55   | 550  | 549  | 547  | 546  | 545  | 544  | 543  | 54   | 541  | 541  | 540  | 54   | 539  | 539  | 539  |
| 2          | 581  | 580  | 578  | 577  | 576  | 575  | 574  | 574  | 573  | 572  | 572  | 571  | 571  | 571  | 570  | 570  | 570  | 570  |
| - 001      | 66   | 605  | 64   | 603  | 603  | 60   | 6    | 602  | 60   | 601  | 601  | 60   | 601  | 601  | 600  | 600  | 600  | 600  |
| 0          | 630  | 630  | 63   | 630  | 630  | 63   | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  | 630  |
| + 001      | 655  | 655  | 656  | 650  | 657  | 657  | 658  | 658  | 658  | 659  | 659  | 660  | 660  | 660  | 660  | 660  | 66   | 660  |
| 2          | 679  | 680  | 68   | 683  | 684  | 685  | 686  | 686  | 687  | 688  | 688  | 689  | 689  | 689  | 690  | 690  | 690  | 690  |
| 3          | 704  | 705  | 78   | 709  | 711  | 71   | 714  | 715  | 716  | 717  | 717  | 718  | 719  | 719  | 720  | 70   | 720  | 720  |
| 4          | 79   | 731  | 734  | 736  | 738  | 740  | 742  | 744  | 745  | 746  | 747  | 748  | 749  | 750  | 750  | 751  | 751  | 751  |
| 5          | 754  | 756  | 76   | 76   | 765  | 767  | 770  | 772  | 774  | 775  | 776  | 777  | 779  | 78   | 780  | 781  | 781  | 781  |
| + 006      | 778  | 782  | 785  | 789  | 79   | 795  | 797  | 800  | 802  | 804  | 806  | 807  | 808  | 89   | 810  | 811  | 811  | 811  |
| 7          | 803  | 807  | 811  | 815  | 819  | 82   | 85   | 828  | 831  | 833  | 835  | 836  | 838  | 839  | 840  | 841  | 841  | 841  |
| 8          | 87   | 83   | 837  | 84   | 846  | 850  | 853  | 856  | 859  | 862  | 864  | 866  | 867  | 869  | 870  | 871  | 871  | 871  |
| 9          | 85   | 857  | 863  | 868  | 873  | 877  | 881  | 884  | 888  | 891  | 893  | 895  | 897  | 899  | 90   | 901  | 901  | 901  |
| 10         | 876  | 882  | 889  | 894  | 899  | 904  | 908  | 913  | 916  | 919  | 92   | 924  | 926  | 928  | 99   | 930  | 931  | 931  |
| + 011      | 91   | 907  | 915  | 91   | 926  | 93   | 936  | 941  | 945  | 948  | 951  | 954  | 956  | 958  | 959  | 960  | 961  | 961  |
| 12         | 925  | 933  | 941  | 948  | 954  | 960  | 965  | 970  | 974  | 978  | 981  | 984  | 987  | 988  | 990  | 991  | 99   | 99   |
| 13         | 95   | 958  | 967  | 974  | 981  | 987  | 993  | 998  | 103  | 1007 | 1010 | 1013 | 1017 | 1018 | 1020 | 1021 | 1022 | 1022 |
| 14         | 974  | 984  | 992  | 101  | 108  | 1014 | 1020 | 1026 | 1031 | 1036 | 1039 | 1043 | 1046 | 1048 | 1049 | 1051 | 1052 | 1052 |
| 15         | 999  | 109  | 1018 | 1027 | 1035 | 1041 | 148  | 1054 | 1060 | 1065 | 1068 | 107  | 1076 | 1078 | 179  | 1081 | 1082 | 1082 |
| + 016      | 1023 | 1034 | 1044 | 1053 | 1061 | 1069 | 1076 | 1083 | 1088 | 1093 | 1098 | 1101 | 1105 | 1107 | 1109 | 1111 | 1112 | 1112 |
| 17         | 1048 | 1059 | 170  | 1180 | 1088 | 1096 | 114  | 1111 | 1117 | 112  | 1127 | 1131 | 1135 | 1137 | 1139 | 1141 | 114  | 1142 |
| 18         | 1073 | 1085 | 1096 | 1107 | 1116 | 115  | 1132 | 1140 | 1146 | 1152 | 1157 | 1161 | 1165 | 1168 | 1170 | 1172 | 1173 | 1173 |
| 19         | 1098 | 1110 | 112  | 1133 | 1143 | 1152 | 1160 | 1168 | 1175 | 1181 | 1186 | 1190 | 1195 | 1198 | 1    | 102  | 103  | 123  |
| + 020      | 112  | 1135 | 1148 | 1159 | 1170 | 1179 | 1188 | 1196 | 103  | 1209 | 115  | 120  | 1224 | 1227 | 129  | 123  | 1233 | 1233 |

Appl d C t t + 0006 Th it th T bl q l to 0000 Th A g m ts f th T bl th Vari tl tak fr m T bl XXXIII XXXVI  
d th Latit d fr m T bl XXXVII XLVI

# SATELLITE II

## Tables of the Phenomena

LVII

Reductions to Middle

Argument Q

| 1              | 2                              | 3    | 4              | 5                              |
|----------------|--------------------------------|------|----------------|--------------------------------|
| Ecl., Oc.      | $\Delta$<br>0 <sup>d</sup> .01 | Q    | Sh., Tr.       | $\Delta$<br>0 <sup>d</sup> .01 |
| d<br>-0'000435 | - 29                           | 0'00 | d<br>-0'000487 | - 37                           |
| 492            | 28                             | 0'02 | 561            | 37                             |
| 549            | 29                             | 0'04 | 636            | 37                             |
| 606            | 28                             | 0'06 | 710            | 37                             |
| 661            | 27                             | 0'08 | 782            | 36                             |
| 715            | 27                             | 0'10 | 853            | 35                             |
| -0'000769      | - 26                           | 0'12 | -0'000922      | - 34                           |
| 820            | 25                             | 0'14 | 989            | 33                             |
| 869            | 24                             | 0'16 | 1054           | 32                             |
| 916            | 23                             | 0'18 | 1116           | 30                             |
| 961            | 22                             | 0'20 | 1174           | 28                             |
| -0'001004      | - 21                           | 0'22 | -0'001229      | - 27                           |
| 1044           | 19                             | 0'24 | 1281           | 25                             |
| 1080           | 17                             | 0'26 | 1328           | 23                             |
| 1112           | 16                             | 0'28 | 1371           | 21                             |
| 1142           | 14                             | 0'30 | 1410           | 18                             |
| -0'001168      | - 12                           | 0'32 | -0'001444      | - 16                           |
| 1191           | 11                             | 0'34 | 1473           | 14                             |
| 1210           | 9                              | 0'36 | 1498           | 11                             |
| 1225           | 6                              | 0'38 | 1517           | 8                              |
| 1235           | 4                              | 0'40 | 1531           | 6                              |
| -0'001242      | - 2                            | 0'42 | -0'001540      | - 3                            |
| 1245           | - 1                            | 0'44 | 1544           | - 1                            |
| 1244           | + 2                            | 0'46 | 1542           | + 2                            |
| 1238           | 4                              | 0'48 | 1535           | 5                              |
| 1229           | 6                              | 0'50 | 1523           | 7                              |
| -0'001216      | + 8                            | 0'52 | -0'001506      | + 10                           |
| 1199           | 10                             | 0'54 | 1483           | 13                             |
| 1177           | 12                             | 0'56 | 1455           | 15                             |
| 1152           | 13                             | 0'58 | 1423           | 17                             |
| 1124           | 15                             | 0'60 | 1386           | 20                             |
| -0'001092      | + 16                           | 0'62 | -0'001345      | + 22                           |
| 1057           | 18                             | 0'64 | 1299           | 24                             |
| 1019           | 20                             | 0'66 | 1250           | 26                             |
| 978            | 21                             | 0'68 | 1196           | 28                             |
| 934            | 23                             | 0'70 | 1138           | 30                             |
| -0'000888      | + 24                           | 0'72 | -0'001078      | + 31                           |
| 840            | 25                             | 0'74 | 1015           | 32                             |
| 789            | 26                             | 0'76 | 949            | 34                             |
| 736            | 27                             | 0'78 | 881            | 35                             |
| 682            | 27                             | 0'80 | 810            | 36                             |
| -0'000627      | + 28                           | 0'82 | -0'000738      | + 36                           |
| 571            | 28                             | 0'84 | 665            | 37                             |
| 515            | 28                             | 0'86 | 591            | 37                             |
| 458            | 29                             | 0'88 | 517            | 37                             |
| 400            | 29                             | 0'90 | 442            | 38                             |
| -0'000343      | + 28                           | 0'92 | -0'000367      | + 37                           |
| 286            | 28                             | 0'94 | 293            | 37                             |
| 231            | 28                             | 0'96 | 220            | 36                             |
| 175            | 27                             | 0'98 | 148            | 35                             |
| -0'000122      | + 26                           | 1'00 | -0'000078      | + 35                           |

| 1              | 2                              | 3    | 4              | 5                              |
|----------------|--------------------------------|------|----------------|--------------------------------|
| Ecl., Oc.      | $\Delta$<br>0 <sup>d</sup> .01 | Q    | Sh., Tr.       | $\Delta$<br>0 <sup>d</sup> .01 |
| d<br>-0'000122 | + 26                           | 1'00 | d<br>-0'000078 | + 35                           |
| 70             | 26                             | 0'02 | - 10           | 33                             |
| - 19           | 25                             | 0'04 | + 55           | 32                             |
| + 29           | 24                             | 0'06 | 118            | 31                             |
| 74             | 22                             | 0'08 | 177            | 29                             |
| 117            | 21                             | 0'10 | 234            | 28                             |
| +0'000158      | + 20                           | 1'12 | +0'000287      | + 26                           |
| 196            | 18                             | 0'14 | 336            | 24                             |
| 230            | 16                             | 0'16 | 381            | 21                             |
| 261            | 15                             | 0'18 | 421            | 19                             |
| 288            | 13                             | 0'20 | 457            | 17                             |
| +0'000312      | + 11                           | 1'22 | +0'000488      | + 14                           |
| 333            | 9                              | 0'24 | 514            | 12                             |
| 349            | 7                              | 0'26 | 535            | 10                             |
| 362            | 5                              | 0'28 | 552            | 7                              |
| 369            | 3                              | 0'30 | 563            | 4                              |
| +0'000373      | + 1                            | 1'32 | +0'000569      | + 2                            |
| 374            | - 1                            | 0'34 | 569            | - 1                            |
| 370            | 3                              | 0'36 | 564            | 4                              |
| 363            | 5                              | 0'38 | 554            | 6                              |
| 352            | 7                              | 0'40 | 539            | 9                              |
| +0'000336      | - 9                            | 1'42 | +0'000519      | - 12                           |
| 316            | 11                             | 0'44 | 493            | 14                             |
| 292            | 13                             | 0'46 | 462            | 17                             |
| 265            | 14                             | 0'48 | 427            | 19                             |
| 235            | 16                             | 0'50 | 387            | 21                             |
| +0'000202      | - 18                           | 1'52 | +0'000343      | - 21                           |
| 165            | 19                             | 0'54 | 296            | 24                             |
| 125            | 21                             | 0'56 | 243            | 27                             |
| 82             | 22                             | 0'58 | 187            | 29                             |
| + 36           | 24                             | 0'60 | 128            | 30                             |
| -0'000012      | - 25                           | 1'62 | +0'000066      | - 34                           |
| 62             | 25                             | 0'64 | + 1            | 33                             |
| 113            | 26                             | 0'66 | - 67           | 35                             |
| 166            | 27                             | 0'68 | 137            | 36                             |
| 220            | 28                             | 0'70 | 208            | 36                             |
| -0'000277      | - 28                           | 1'72 | -0'000281      | - 37                           |
| 334            | 29                             | 0'74 | 355            | 37                             |
| 391            | 28                             | 0'76 | 429            | 37                             |
| 448            | 28                             | 0'78 | 504            | 37                             |
| 504            | 28                             | 0'80 | 578            | 37                             |
| -0'000561      | - 29                           | 1'82 | -0'000653      | - 37                           |
| 618            | 28                             | 0'84 | 726            | 36                             |
| 674            | 27                             | 0'86 | 798            | 35                             |
| 727            | 27                             | 0'88 | 869            | 35                             |
| 780            | 26                             | 0'90 | 937            | 34                             |
| -0'000831      | - 25                           | 1'92 | -0'001004      | - 31                           |
| 880            | 24                             | 0'94 | 1067           | 31                             |
| 927            | 23                             | 0'96 | 1129           | 30                             |
| 971            | 21                             | 0'98 | 1187           | 28                             |
| -0'001012      | - 20                           | 2'00 | -0'001241      | - 26                           |

Applied Constant: -0<sup>d</sup>.000461.

This Table includes a constant portion of the Equation of Light.

The Entry must be

supplemented by Equations from Tables LVIII-LXV.

The whole must be corrected by adding to it its product by the Variation, as drawn from

Tables XXXIII-XXXVI.

For Shadows and Transits it must also be corrected for Jupiter's Phase by Table LXVI.

# SATELLITE II

## Tables of the Phenomena

LVII *continued*

Reductions to Middle

Argument Q

| Ecl Oc       | $\Delta$<br>o or | 3<br>Q | 4<br>Sh T       | 5<br>$\Delta$<br>o or |
|--------------|------------------|--------|-----------------|-----------------------|
| d<br>- 0 0 I | - 20             | 2 00   | d<br>- 0 001241 | - 6                   |
| 105          | 18               | 02     | 1292            | 24                    |
| 1087         | 17               | 04     | 1338            | 2                     |
| 1119         | 15               | 06     | 1380            | 0                     |
| 1148         | 13               | 08     | 1418            | 18                    |
| 1173         | 1                | 10     | 1451            | 15                    |
| - 0 001196   | - 10             | 2 12   | - 0 001479      | - 13                  |
| 1 14         | 8                | 14     | 1503            | 11                    |
| 1 8          | 6                | 16     | 1521            | 8                     |
| 1237         | 4                | 18     | 1534            | 5                     |
| 1243         | - 2              | 20     | 1541            | - 3                   |
| - 0 01 45    | 0                | 2 22   | - 0 001544      |                       |
| 1243         | +                | 24     | 1541            | +                     |
| 1 36         | 4                | 26     | 1533            | 5                     |
| 1 26         | 6                | 28     | 1520            | 8                     |
| 1 12         | 8                | 30     | 1502            | 11                    |
| - 0 001195   | + 10             | 2 32   | - 0 001477      | + 13                  |
| 1172         | 1                | 34     | 1448            | 15                    |
| 1146         | 14               | 36     | 1416            | 18                    |
| 1117         | 15               | 38     | 1377            | 20                    |
| 1085         | 17               | 40     | 1335            | 2                     |
| - 0 001049   | + 19             | 2 42   | - 0 001288      | + 24                  |
| 1010         | 20               | 44     | 1 39            | 6                     |
| 969          | 1                | 46     | 1184            | 28                    |
| 9 4          | 23               | 48     | 1126            | 30                    |
| 877          | 24               | 50     | 1064            | 32                    |
| - 0 000829   | + 25             | 2 52   | - 0 001001      | + 33                  |
| 778          | 26               | 54     | 934             | 34                    |
| 7 4          | 7                | 56     | 866             | 35                    |
| 670          | 7                | 58     | 794             | 36                    |
| 615          | 28               | 60     | 722             | 36                    |
| - 0 000559   | + 28             | 2 62   | - 0 000649      | + 37                  |
| 503          | 28               | 64     | 575             | 37                    |
| 445          | 9                | 66     | 501             | 38                    |
| 387          | 9                | 68     | 4 5             | 38                    |
| 331          | 28               | 70     | 351             | 37                    |
| - 0 000274   | + 8              | 2 72   | - 0 000277      | + 37                  |
| 19           | 8                | 74     | 204             | 36                    |
| 163          | 27               | 76     | 133             | 35                    |
| 111          | 26               | 78     | 63              | 34                    |
| 59           | 6                | 80     | +               | 5                     |
| 0 000008     | + 25             | 2 82   | + 0 000069      | + 32                  |
| +            | 40               | 84     | 132             | 30                    |
| 84           | 2                | 86     | 190             | 29                    |
| 1 6          | 21               | 88     | 46              | 27                    |
| 167          | 19               | 90     | 298             | 25                    |
| + 0 000204   | + 17             | 2 92   | + 0 000347      | + 3                   |
| 37           | 16               | 94     | 390             | 1                     |
| 68           | 14               | 96     | 4 9             | 19                    |
| 94           | 1                | 98     | 464             | 16                    |
| + 0 000317   | + 11             | 3 00   | + 0 000494      | + 14                  |

| Fcl Oc          | $\Delta$<br>o or | 3<br>Q | 4<br>Sh T  | 5<br>$\Delta$<br>o or |
|-----------------|------------------|--------|------------|-----------------------|
| d<br>+ 0 000317 | + 11             | 3 00   | + 0 000494 | + 14                  |
| 337             | 9                | 02     | 519        | 11                    |
| 35              | 7                | 04     | 539        | 9                     |
| 364             | 5                | 06     | 555        | 7                     |
| 370             | 2                | 08     | 565        | 4                     |
| 373             | + 1              | 10     | 570        | + 1                   |
| + 0 000374      | - 1              | 3 12   | + 0 000569 | - 2                   |
| 369             | 3                | 14     | 56         | 5                     |
| 361             | 5                | 16     | 551        | 7                     |
| 349             | 7                | 18     | 535        | 9                     |
| 33              | 10               | 20     | 514        | 12                    |
| + 0 000311      | - 12             | 3 22   | + 0 000487 | - 14                  |
| 286             | 13               | 24     | 455        | 17                    |
| 259             | 15               | 26     | 419        | 19                    |
| 228             | 16               | 28     | 378        | 21                    |
| 194             | 18               | 30     | 333        | 23                    |
| + 0 000157      | - 20             | 3 32   | + 0 000285 | - 25                  |
| 116             | 21               | 34     | 31         | 28                    |
| 72              | 23               | 36     | 174        | 29                    |
| +               | 25               | 38     | 115        | 31                    |
| -               | 23               | 40     | +          | 52                    |
| - 0 000073      | - 25             | 3 42   | - 0 000014 | - 34                  |
| 1 4             | 26               | 44     | 82         | 35                    |
| 178             | 27               | 46     | 152        | 36                    |
| 232             | 8                | 48     | 224        | 36                    |
| 89              | 28               | 50     | 297        | 37                    |
| - 0 000347      | - 29             | 3 52   | - 0 000371 | - 37                  |
| 403             | 8                | 54     | 445        | 37                    |
| 460             | 28               | 56     | 520        | 37                    |
| 516             | 28               | 58     | 594        | 37                    |
| 574             | 9                | 60     | 669        | 37                    |
| - 0 000630      | - 28             | 3 62   | - 0 000742 | - 36                  |
| 686             | 27               | 64     | 813        | 36                    |
| 739             | 26               | 66     | 884        | 35                    |
| 791             | 26               | 68     | 952        | 34                    |
| 84              | 25               | 70     | 1019       | 32                    |
| - 0 000891      | - 24             | 3 72   | - 0 001081 | - 31                  |
| 937             | 2                | 74     | 1142       | 30                    |
| 980             | 1                | 76     | 1199       | 28                    |
| 102             | 20               | 78     | 1 52       | 26                    |
| 1061            | 18               | 80     | 1303       | 24                    |
| - 0 001095      | - 16             | 3 82   | - 0 001348 | - 22                  |
| 11 6            | 15               | 84     | 1390       | 20                    |
| 1154            | 13               | 86     | 1426       | 17                    |
| 1179            | 1                | 88     | 1458       | 15                    |
| 1201            | 10               | 90     | 1485       | 13                    |
| - 0 001218      | - 7              | 3 92   | - 0 001508 | - 10                  |
| 1230            | 5                | 94     | 1524       | 7                     |
| 1239            | 3                | 96     | 1536       | 5                     |
| 1244            | - 2              | 98     | 1543       | - 2                   |
| - 0 001 46      | 0                | 4 00   | - 0 001545 | 0                     |

Appli dC t t 000 6      Thi T bl i l d      t t p r t i f t h Eq t i f l i g h t      Th E t y m u s t b  
 ppl m t d by Eq t i f T bl LVIII LXV      Th h i m t b      t d by d d i g t o i t i t p d t b y t h V a r t i a s d r w f r m  
 T bl XXIII XXXVI      F Sh l w d T i t m t a l b      t d f J p i t Ph by T bl LXVI

# SATELLITE II

## Tables of the Phenomena

LVIII

Reductions to Middle

Argument R

| 1             | 2                 | 3    | 4             | 5                 |
|---------------|-------------------|------|---------------|-------------------|
| Ecl. Oc.      | $\Delta_{0^d.01}$ | R    | Sh., Tr.      | $\Delta_{0^d.01}$ |
| d<br>0'000320 | - 10              | 0'00 | d<br>0'000320 | - 11              |
| 301           | 9                 | 0'02 | 298           | 11                |
| 282           | 9                 | 0'04 | 277           | 10                |
| 264           | 9                 | 0'06 | 256           | 10                |
| 246           | 9                 | 0'08 | 236           | 10                |
| 229           | 9                 | 0'10 | 216           | 10                |
| 0'000212      | - 8               | 0'12 | 0'000197      | - 10              |
| 195           | 8                 | 0'14 | 177           | 9                 |
| 179           | 8                 | 0'16 | 159           | 9                 |
| 163           | 8                 | 0'18 | 141           | 9                 |
| 148           | 7                 | 0'20 | 124           | 8                 |
| 0'000134      | - 7               | 0'22 | 0'000108      | - 8               |
| 122           | 6                 | 0'24 | 94            | 7                 |
| 110           | 6                 | 0'26 | 81            | 6                 |
| 100           | 5                 | 0'28 | 69            | 6                 |
| 90            | 5                 | 0'30 | 57            | 6                 |
| 0'000081      | - 4               | 0'32 | 0'000047      | - 5               |
| 74            | 3                 | 0'34 | 39            | 4                 |
| 68            | 3                 | 0'36 | 32            | 3                 |
| 63            | 2                 | 0'38 | 27            | 3                 |
| 59            | 2                 | 0'40 | 22            | 2                 |
| 0'000057      | - 1               | 0'42 | 0'000020      | - 1               |
| 56            | 0                 | 0'44 | 19            | 0                 |
| 57            | + 1               | 0'46 | 19            | + 1               |
| 58            | 1                 | 0'48 | 21            | 1                 |
| 61            | 2                 | 0'50 | 24            | 2                 |
| 0'000065      | + 3               | 0'52 | 0'000029      | + 3               |
| 71            | 3                 | 0'54 | 36            | 4                 |
| 78            | 4                 | 0'56 | 44            | 4                 |
| 86            | 5                 | 0'58 | 53            | 5                 |
| 96            | 5                 | 0'60 | 64            | 6                 |
| 0'000106      | + 6               | 0'62 | 0'000076      | + 6               |
| 118           | 6                 | 0'64 | 89            | 7                 |
| 130           | 6                 | 0'66 | 103           | 7                 |
| 143           | 7                 | 0'68 | 118           | 8                 |
| 157           | 7                 | 0'70 | 134           | 9                 |
| 0'000173      | + 8               | 0'72 | 0'000152      | + 9               |
| 189           | 8                 | 0'74 | 170           | 9                 |
| 205           | 8                 | 0'76 | 189           | 10                |
| 222           | 9                 | 0'78 | 209           | 10                |
| 240           | 9                 | 0'80 | 229           | 10                |
| 0'000258      | + 9               | 0'82 | 0'000249      | + 10              |
| 276           | 9                 | 0'84 | 270           | 10                |
| 294           | 9                 | 0'86 | 290           | 11                |
| 313           | 10                | 0'88 | 312           | 11                |
| 332           | 9                 | 0'90 | 333           | 10                |
| 0'000350      | + 9               | 0'92 | 0'000354      | + 11              |
| 368           | 9                 | 0'94 | 375           | 10                |
| 387           | 9                 | 0'96 | 396           | 10                |
| 405           | 9                 | 0'98 | 417           | 10                |
| 0'000422      | + 8               | 1'00 | 0'000437      | + 9               |

| 1             | 2                 | 3    | 4             | 5                 |
|---------------|-------------------|------|---------------|-------------------|
| Ecl. Oc.      | $\Delta_{0^d.01}$ | R    | Sh., Tr.      | $\Delta_{0^d.01}$ |
| d<br>0'000422 | + 8               | 1'00 | d<br>0'000437 | + 9               |
| 438           | 8                 | 0'02 | 455           | 9                 |
| 455           | 8                 | 0'04 | 474           | 9                 |
| 471           | 8                 | 0'06 | 492           | 9                 |
| 486           | 7                 | 0'08 | 510           | 9                 |
| 500           | 7                 | 0'10 | 526           | 8                 |
| 0'000513      | + 6               | 1'12 | 0'000540      | + 7               |
| 525           | 6                 | 0'14 | 554           | 7                 |
| 536           | 6                 | 0'16 | 567           | 6                 |
| 547           | 5                 | 0'18 | 579           | 6                 |
| 556           | 4                 | 0'20 | 590           | 5                 |
| 0'000563      | + 4               | 1'22 | 0'000598      | + 4               |
| 570           | 3                 | 0'24 | 606           | 3                 |
| 575           | 2                 | 0'26 | 611           | 3                 |
| 579           | 2                 | 0'28 | 616           | 2                 |
| 582           | 1                 | 0'30 | 619           | 1                 |
| 0'000584      | + 1               | 1'32 | 0'000621      | + 1               |
| 584           | 0                 | 0'34 | 621           | 0                 |
| 583           | - 1               | 0'36 | 620           | - 1               |
| 580           | 2                 | 0'38 | 617           | 2                 |
| 576           | 2                 | 0'40 | 612           | 3                 |
| 0'000571      | - 3               | 1'42 | 0'000607      | - 3               |
| 565           | 4                 | 0'44 | 600           | 4                 |
| 557           | 4                 | 0'46 | 591           | 5                 |
| 548           | 5                 | 0'48 | 580           | 6                 |
| 538           | 5                 | 0'50 | 569           | 6                 |
| 0'000527      | - 6               | 1'52 | 0'000556      | - 7               |
| 515           | 6                 | 0'54 | 542           | 7                 |
| 502           | 7                 | 0'56 | 528           | 7                 |
| 488           | 7                 | 0'58 | 512           | 8                 |
| 473           | 8                 | 0'60 | 495           | 9                 |
| 0'000457      | - 8               | 1'62 | 0'000477      | - 9               |
| 441           | 8                 | 0'64 | 458           | 10                |
| 425           | 9                 | 0'66 | 439           | 10                |
| 407           | 9                 | 0'68 | 419           | 10                |
| 389           | 9                 | 0'70 | 399           | 10                |
| 0'000371      | - 9               | 1'72 | 0'000378      | - 10              |
| 353           | 9                 | 0'74 | 358           | 11                |
| 334           | 9                 | 0'76 | 336           | 11                |
| 316           | 9                 | 0'78 | 315           | 10                |
| 297           | 9                 | 0'80 | 294           | 11                |
| 0'000279      | - 9               | 1'82 | 0'000273      | - 11              |
| 260           | 9                 | 0'84 | 251           | 10                |
| 242           | 9                 | 0'86 | 231           | 10                |
| 224           | 9                 | 0'88 | 210           | 10                |
| 207           | 8                 | 0'90 | 191           | 9                 |
| 0'000191      | - 8               | 1'92 | 0'000173      | - 9               |
| 175           | 8                 | 0'94 | 154           | 9                 |
| 160           | 7                 | 0'96 | 137           | 8                 |
| 145           | 7                 | 0'98 | 120           | 8                 |
| 0'000131      | - 7               | 2'00 | 0'000104      | - 8               |

Applied Constant: +0'000320.

# SATELLITE II

## Tables of the Phenomena

Reductions to Middle

LIX

| A  | Ec<br>Sh | Oc<br>Tr | 3<br>o |
|----|----------|----------|--------|
| d  |          |          |        |
| 00 | 0 000061 |          | + 10   |
| 2  | 8        |          | 1      |
| 4  | 101      |          | 9      |
| 6  | 114      |          | 5      |
| 8  | 1 1      |          | + 2    |
| 10 | 1        |          | -      |
| 12 | 0 00 113 |          | - 6    |
| 4  | 97       |          | 9      |
| 6  | 78       |          | 10     |
| 8  | 57       |          | 11     |
| 20 | 36       |          | 1      |
| 22 | 0 000018 |          | - 8    |
| 4  | 6        |          | 5      |
| 6  | 0        |          | - 1    |
| 8  |          |          | + 3    |
| 30 | 1        |          | 7      |
| 32 | 0 000027 |          | + 9    |
| 4  | 47       |          | 1      |
| 6  | 69       |          | 11     |
| 8  | 89       |          | 10     |
| 40 | 106      |          | 8      |
| 42 | 0 000117 |          | + 4    |
| 4  | 1 1      |          | + 1    |
| 6  | 118      |          | - 4    |
| 8  | 108      |          | 7      |
| 50 | 91       |          | 1      |
| 52 | 0 000071 |          | - 11   |
| 4  | 49       |          | 11     |
| 6  | 29       |          | 9      |
| 8  | 12       |          | 7      |
| 60 | 3        |          | - 3    |
| 62 | 0 000000 |          | 0      |
| 4  | 4        |          | + 4    |
| 6  | 17       |          | 8      |
| 8  | 34       |          | 10     |
| 70 | 54       |          | 11     |
| 72 | 000076   |          | + 10   |
| 4  | 96       |          | 9      |
| 6  | 112      |          | 7      |
| 8  | 12       |          | + 3    |
| 80 | 0 000122 |          | - 1    |

0 t t + 00006

LX

| Lc       | Oc | P    | 3<br>Sh Tr |
|----------|----|------|------------|
| 0 000029 |    | 1850 | 0 0 0011   |
|          |    | 52   | 18         |
| 14       |    | 54   | 26         |
| 7        |    | 56   | 33         |
|          |    | 58   | 38         |
| 0        |    | 60   | 40         |
| 000002   |    | 1862 | 0 000040   |
| 5        |    | 64   | 35         |
| 12       |    | 66   | 28         |
| 2        |    | 68   | 20         |
| 7        |    | 70   | 13         |
| 0 000033 |    | 1872 | 0 0 0007   |
| 37       |    | 74   | 3          |
| 38       |    | 76   |            |
| 35       |    | 78   | 5          |
| 30       |    | 80   | 10         |
| 0 0000   |    | 1882 | 0 000018   |
| 15       |    | 84   | 5          |
| 8        |    | 86   | 32         |
| 3        |    | 88   | 37         |
| 1        |    | 90   | 39         |
| 0 000002 |    | 1892 | 0 000038   |
| 6        |    | 94   | 34         |
| 13       |    | 96   | 27         |
| 0        |    | 98   | 20         |
| 0 0000 8 |    | 1900 | 0 00001    |

| Ec       | Oc | P    | 3<br>Sh Tr |
|----------|----|------|------------|
| d        |    |      |            |
| 0 0000 8 |    | 1900 | 0 000012   |
|          |    |      |            |
| 34       |    | 02   | 6          |
| 38       |    | 04   |            |
| 39       |    | 06   | 1          |
| 37       |    | 08   | 3          |
| 31       |    | 10   | 9          |
| 0 000024 |    | 1912 | 0 000016   |
| 16       |    | 14   | 24         |
| 10       |    | 16   | 3          |
| 4        |    | 18   | 36         |
|          |    | 20   | 38         |
| 000003   |    | 1922 | 0 000037   |
| 7        |    | 24   | 33         |
| 13       |    | 26   | 27         |
| 21       |    | 28   | 19         |
| 9        |    | 30   | 11         |
| 0 000035 |    | 1932 | 0 000005   |
| 39       |    | 34   | 1          |
| 40       |    | 36   | 0          |
| 37       |    | 38   | 3          |
| 32       |    | 40   | 8          |
| 0 000025 |    | 1942 | 0 000015   |
| 17       |    | 44   | 23         |
| 1        |    | 46   | 30         |
| 5        |    | 48   | 35         |
| 0 000002 |    | 1950 | 0 000038   |

Appl d 0 t t + 00

LXI

| Lc       | Oc | S  | 3<br>Sh Tr |
|----------|----|----|------------|
| 0 000 20 |    | 00 | 0 000020   |
|          |    |    |            |
| 15       |    | 1  | 14         |
| 11       |    | 2  | 1          |
| 8        |    | 3  | 6          |
| 6        |    | 4  | 4          |
| 6        |    | 5  | 4          |
| 00008    |    | 06 | 0 000006   |
| 11       |    | 7  | 10         |
| 16       |    | 8  | 15         |
| 21       |    | 9  | 0          |
| 5        |    | 10 | 26         |
| 0 000029 |    | 11 | 0 000031   |
| 32       |    | 2  | 35         |
| 34       |    | 3  | 36         |
| 34       |    | 4  | 36         |
| 32       |    | 5  | 34         |
| 0 000028 |    | 16 | 0 000030   |
| 24       |    | 7  | 24         |
| 19       |    | 8  | 19         |
| 14       |    | 9  | 13         |
| 0 000010 |    | 20 | 0 000009   |

0 t t + 0000

LXII

| T  | Ec<br>Sh | Oc<br>Tr |
|----|----------|----------|
| d  |          |          |
| 00 | 0 000010 |          |
|    |          |          |
| 2  |          | 8        |
| 4  |          | 6        |
| 6  |          | 7        |
| 8  |          | 9        |
| 10 |          | 11       |
|    |          |          |
| 12 | 0 000 13 |          |
| 4  | 14       |          |
| 6  | 1        |          |
| 8  | 10       |          |
| 20 | 0 000007 |          |

0 t t + 0000

LXIII

| U  | Ec<br>Sh | Oc<br>Tr | U  | Ec<br>Sh | Oc<br>Tr |
|----|----------|----------|----|----------|----------|
| 00 | 0 000030 |          | 20 | 0 000015 |          |
|    |          |          |    |          |          |
| 1  |          | 23       | 1  |          | 10       |
| 2  |          | 16       | 2  |          | 9        |
| 3  |          | 11       | 3  |          | 10       |
| 4  |          | 9        | 4  |          | 13       |
| 5  |          | 9        | 5  |          | 18       |
| 06 | 0 000012 |          | 26 | 0 000025 |          |
| 7  |          | 17       | 7  |          | 3        |
| 8  |          | 23       | 8  |          | 40       |
| 9  |          | 31       | 9  |          | 46       |
| 10 |          | 38       | 30 |          | 50       |
| 11 | 0 000045 |          | 31 | 0 000051 |          |
| 2  |          | 49       | 2  |          | 50       |
| 3  |          | 51       | 3  |          | 47       |
| 4  |          | 51       | 4  |          | 41       |
| 5  |          | 48       | 5  |          | 34       |
| 16 | 0 000042 |          | 36 | 0 000027 |          |
| 7  |          | 36       | 7  |          | 19       |
| 8  |          | 28       | 8  |          | 14       |
| 9  |          | 21       | 9  |          | 10       |
| 20 | 0 000015 |          | 40 | 0 000009 |          |

Const t + 00003

# SATELLITE II

## Tables of the Phenomena

LXIV

Reduction to Middle

Occultations

| Q<br>γ | 0 <sup>d.0</sup> | 0 <sup>d.2</sup> | 0 <sup>d.4</sup> | 0 <sup>d.6</sup> | 0 <sup>d.8</sup> | 1 <sup>d.0</sup> | 1 <sup>d.2</sup> | 1 <sup>d.4</sup> | 1 <sup>d.6</sup> | 1 <sup>d.8</sup> | 2 <sup>d.0</sup> | 2 <sup>d.2</sup> | 2 <sup>d.4</sup> | 2 <sup>d.6</sup> | 2 <sup>d.8</sup> | 3 <sup>d.0</sup> | 3 <sup>d.2</sup> | 3 <sup>d.4</sup> | 3 <sup>d.6</sup> | 3 <sup>d.8</sup> | 4 <sup>d.0</sup> |    |
|--------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----|
| d      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |    |
| 0      | +                | 6                | +                | 6                | +                | 4                | +                | 3                | +                | 1                | -                | 1                | -                | 3                | -                | 5                | -                | 6                | -                | 6                | +                | 4  |
| 10     | +                | 29               | +                | 27               | +                | 22               | +                | 14               | +                | 5                | -                | 6                | -                | 15               | -                | 23               | -                | 27               | -                | 29               | +                | 20 |
| 20     | +                | 50               | +                | 47               | +                | 38               | +                | 25               | +                | 8                | -                | 10               | -                | 26               | -                | 40               | -                | 48               | -                | 50               | +                | 35 |
| 30     | +                | 71               | +                | 66               | +                | 54               | +                | 35               | +                | 11               | -                | 14               | -                | 37               | -                | 56               | -                | 67               | -                | 71               | +                | 49 |
| 40     | +                | 89               | +                | 84               | +                | 67               | +                | 43               | +                | 14               | -                | 17               | -                | 47               | -                | 70               | -                | 85               | -                | 89               | +                | 62 |
| 50     | +                | 105              | +                | 98               | +                | 79               | +                | 51               | +                | 17               | -                | 20               | -                | 55               | -                | 82               | -                | 100              | -                | 105              | +                | 73 |
| 60     | +                | 117              | +                | 110              | +                | 89               | +                | 57               | +                | 18               | -                | 23               | -                | 62               | -                | 92               | -                | 112              | -                | 117              | +                | 82 |
| 70     | +                | 126              | +                | 119              | +                | 96               | +                | 62               | +                | 20               | -                | 25               | -                | 66               | -                | 100              | -                | 120              | -                | 126              | +                | 88 |
| 80     | +                | 132              | +                | 124              | +                | 100              | +                | 64               | +                | 21               | -                | 26               | -                | 69               | -                | 104              | -                | 126              | -                | 132              | +                | 92 |
| 90     | +                | 133              | +                | 125              | +                | 101              | +                | 65               | +                | 21               | -                | 26               | -                | 70               | -                | 105              | -                | 127              | -                | 133              | +                | 93 |
| 100    | +                | 130              | +                | 123              | +                | 99               | +                | 64               | +                | 21               | -                | 26               | -                | 69               | -                | 103              | -                | 125              | -                | 130              | +                | 91 |
| 110    | +                | 124              | +                | 117              | +                | 94               | +                | 61               | +                | 20               | -                | 24               | -                | 65               | -                | 98               | -                | 119              | -                | 124              | +                | 87 |
| 120    | +                | 114              | +                | 107              | +                | 87               | +                | 56               | +                | 18               | -                | 22               | -                | 60               | -                | 90               | -                | 109              | -                | 114              | +                | 80 |
| 130    | +                | 101              | +                | 95               | +                | 77               | +                | 49               | +                | 16               | -                | 20               | -                | 53               | -                | 80               | -                | 96               | -                | 101              | +                | 71 |
| 140    | +                | 85               | +                | 80               | +                | 64               | +                | 41               | +                | 13               | -                | 17               | -                | 45               | -                | 67               | -                | 81               | -                | 85               | +                | 59 |
| 150    | +                | 66               | +                | 62               | +                | 50               | +                | 32               | +                | 10               | -                | 13               | -                | 35               | -                | 52               | -                | 63               | -                | 66               | +                | 46 |
| 160    | +                | 45               | +                | 42               | +                | 34               | +                | 22               | +                | 7                | -                | 9                | -                | 24               | -                | 36               | -                | 43               | -                | 45               | +                | 32 |
| 170    | +                | 23               | +                | 22               | +                | 17               | +                | 11               | +                | 4                | -                | 4                | -                | 12               | -                | 18               | -                | 22               | -                | 23               | +                | 16 |
| 180    | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                |    |
| 190    | -                | 23               | -                | 21               | -                | 17               | -                | 11               | -                | 4                | +                | 4                | +                | 12               | +                | 18               | +                | 22               | +                | 23               | +                | 16 |
| 200    | -                | 44               | -                | 42               | -                | 34               | -                | 22               | -                | 7                | +                | 9                | +                | 23               | +                | 35               | +                | 42               | +                | 44               | +                | 31 |
| 210    | -                | 65               | -                | 62               | -                | 50               | -                | 32               | -                | 10               | +                | 13               | +                | 34               | +                | 52               | +                | 62               | +                | 65               | +                | 46 |
| 220    | -                | 84               | -                | 79               | -                | 64               | -                | 41               | -                | 13               | +                | 16               | +                | 44               | +                | 66               | +                | 80               | +                | 84               | +                | 59 |
| 230    | -                | 101              | -                | 95               | -                | 76               | -                | 49               | -                | 16               | +                | 20               | +                | 53               | +                | 79               | +                | 96               | +                | 101              | +                | 70 |
| 240    | -                | 114              | -                | 107              | -                | 86               | -                | 56               | -                | 18               | +                | 22               | +                | 60               | +                | 90               | +                | 109              | +                | 114              | +                | 80 |
| 250    | -                | 124              | -                | 117              | -                | 94               | -                | 61               | -                | 20               | +                | 24               | +                | 65               | +                | 98               | +                | 118              | +                | 124              | +                | 87 |
| 260    | -                | 130              | -                | 123              | -                | 99               | -                | 64               | -                | 21               | +                | 26               | +                | 69               | +                | 103              | +                | 125              | +                | 130              | +                | 91 |
| 270    | -                | 133              | -                | 125              | -                | 101              | -                | 65               | -                | 21               | +                | 26               | +                | 70               | +                | 105              | +                | 127              | +                | 133              | +                | 93 |
| 280    | -                | 132              | -                | 124              | -                | 100              | -                | 64               | -                | 21               | +                | 26               | +                | 69               | +                | 104              | +                | 126              | +                | 132              | +                | 92 |
| 290    | -                | 126              | -                | 119              | -                | 96               | -                | 62               | -                | 20               | +                | 25               | +                | 66               | +                | 100              | +                | 121              | +                | 126              | +                | 88 |
| 300    | -                | 117              | -                | 110              | -                | 89               | -                | 57               | -                | 19               | +                | 23               | +                | 62               | +                | 93               | +                | 112              | +                | 117              | +                | 82 |
| 310    | -                | 105              | -                | 99               | -                | 80               | -                | 51               | -                | 17               | +                | 20               | +                | 55               | +                | 83               | +                | 100              | +                | 105              | +                | 73 |
| 320    | -                | 89               | -                | 84               | -                | 68               | -                | 44               | -                | 14               | +                | 17               | +                | 47               | +                | 70               | +                | 85               | +                | 89               | +                | 62 |
| 330    | -                | 71               | -                | 67               | -                | 54               | -                | 35               | -                | 11               | +                | 14               | +                | 37               | +                | 56               | +                | 68               | +                | 71               | +                | 50 |
| 340    | -                | 51               | -                | 48               | -                | 38               | -                | 25               | -                | 8                | +                | 10               | +                | 27               | +                | 40               | +                | 48               | +                | 51               | +                | 35 |
| 350    | -                | 29               | -                | 27               | -                | 22               | -                | 14               | -                | 5                | +                | 6                | +                | 15               | +                | 23               | +                | 27               | +                | 29               | +                | 20 |
| 360    | -                | 6                | -                | 6                | -                | 5                | -                | 3                | -                | 1                | +                | 1                | +                | 3                | +                | 5                | +                | 6                | +                | 6                | +                | 4  |
| 370    | +                | 17               | +                | 16               | +                | 13               | +                | 8                | +                | 3                | -                | 3                | -                | 9                | -                | 13               | -                | 16               | -                | 17               | +                | 12 |
| 380    | +                | 39               | +                | 37               | +                | 29               | +                | 19               | +                | 6                | -                | 8                | -                | 20               | -                | 31               | -                | 37               | -                | 39               | +                | 27 |
| 390    | +                | 60               | +                | 57               | +                | 46               | +                | 29               | +                | 9                | -                | 12               | -                | 32               | -                | 47               | -                | 57               | -                | 60               | +                | 42 |
| 400    | +                | 80               | +                | 75               | +                | 60               | +                | 39               | +                | 13               | -                | 16               | -                | 42               | -                | 63               | -                | 76               | -                | 80               | +                | 56 |

The unit in this Table equals 0<sup>d.000000</sup>.

No Constant has been added.

# SATELLITE II

## Tables of the Phenomena

LXV

Reduction to Middle

Transits

| Q<br>γ | 0 <sup>d</sup> 0 | 0 <sup>d</sup> 2 | 0 <sup>d</sup> 4 | 0 <sup>d</sup> 6 | 0 <sup>h</sup> 8 | 1 <sup>d</sup> 0 | 1 <sup>d</sup> 2 | 1 <sup>h</sup> 4 | 1 <sup>d</sup> 6 | 1 <sup>d</sup> 8 | 2 <sup>d</sup> 0 | 2 <sup>d</sup> 2 | 2 <sup>d</sup> 4 | 2 <sup>h</sup> 6 | 2 <sup>d</sup> 8 | 3 <sup>d</sup> 0 | 3 <sup>d</sup> 2 | 3 <sup>h</sup> 4 | 3 <sup>d</sup> 6 | 3 <sup>d</sup> 8 | 4 <sup>d</sup> 0 |
|--------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0      | - 6              | - 5              | - 4              | - 3              | - 1              | + 1              | + 3              | + 4              | + 5              | + 6              | + 5              | + 4              | + 3              | + 1              | - 2              | - 3              | - 4              | - 5              | - 6              | - 5              | - 4              |
| 10     | - 35             | - 33             | - 6              | - 17             | - 6              | + 7              | + 19             | + 27             | + 34             | + 35             | + 32             | + 25             | + 16             | + 4              | - 9              | 20               | - 28             | - 34             | - 35             | - 32             | - 25             |
| 20     | - 64             | - 60             | - 48             | - 31             | - 10             | + 13             | + 34             | + 50             | + 61             | + 64             | + 58             | + 47             | + 8              | + 7              | - 16             | - 36             | - 51             | - 6              | - 63             | - 57             | - 44             |
| 30     | - 90             | - 85             | - 68             | - 44             | - 14             | + 18             | + 48             | + 71             | + 86             | + 90             | + 82             | + 65             | + 40             | + 10             | - 22             | - 51             | - 74             | - 87             | - 90             | - 81             | - 64             |
| 40     | - 114            | - 108            | - 87             | - 57             | - 18             | + 23             | + 61             | + 91             | + 109            | + 114            | + 105            | + 84             | + 52             | + 13             | - 8              | - 65             | - 92             | - 110            | - 114            | - 103            | - 80             |
| 50     | - 137            | - 128            | - 104            | - 67             | - 1              | + 27             | + 7              | + 108            | + 130            | + 137            | + 116            | + 100            | + 61             | + 15             | - 33             | - 77             | - 111            | - 13             | - 136            | - 123            | - 96             |
| 60     | - 153            | - 143            | - 116            | - 75             | - 24             | + 3              | + 81             | + 111            | + 146            | + 153            | + 141            | + 112            | + 69             | + 17             | - 37             | - 86             | - 124            | - 148            | - 15             | - 138            | - 107            |
| 70     | - 165            | - 155            | - 125            | - 81             | - 26             | + 3              | + 87             | + 130            | + 157            | + 165            | + 15             | + 120            | + 74             | + 18             | - 40             | - 93             | - 134            | - 159            | - 164            | - 149            | - 116            |
| 80     | - 17             | - 161            | - 131            | 84               | - 27             | + 34             | + 91             | + 135            | + 164            | + 172            | + 158            | + 116            | + 77             | + 19             | - 4              | - 97             | - 139            | - 166            | - 171            | - 155            | - 121            |
| 90     | - 174            | - 163            | - 13             | - 85             | - 7              | + 34             | + 9              | + 137            | + 166            | + 174            | + 160            | + 127            | + 78             | + 19             | - 4              | - 98             | - 141            | - 168            | - 173            | - 157            | - 12             |
| 100    | - 171            | - 160            | - 19             | - 83             | - 26             | + 33             | + 90             | + 134            | + 163            | + 171            | + 157            | + 125            | + 77             | + 19             | - 41             | - 96             | - 138            | - 165            | - 170            | - 154            | - 120            |
| 110    | - 163            | - 152            | - 123            | - 79             | - 5              | + 32             | + 86             | + 128            | + 155            | + 163            | + 149            | + 119            | + 73             | + 18             | - 39             | - 9              | - 132            | - 157            | - 16             | - 147            | - 114            |
| 120    | - 149            | - 140            | - 113            | - 73             | - 3              | + 29             | + 79             | + 118            | + 143            | + 149            | + 137            | + 109            | + 67             | + 16             | - 36             | - 84             | - 121            | - 144            | - 149            | - 135            | - 105            |
| 130    | - 132            | - 124            | - 100            | 65               | - 20             | + 6              | + 70             | + 104            | + 126            | + 132            | + 111            | + 96             | + 59             | + 14             | - 32             | 74               | - 107            | - 128            | - 131            | - 119            | - 93             |
| 140    | 113              | - 106            | - 85             | - 54             | - 17             | + 2              | + 59             | + 88             | + 108            | + 113            | + 104            | + 8              | + 50             | + 12             | - 7              | - 62             | - 91             | - 109            | - 112            | - 101            | - 79             |
| 150    | - 88             | - 83             | - 66             | - 42             | - 13             | + 17             | + 46             | + 69             | + 84             | + 88             | + 81             | + 64             | + 39             | + 9              | - 21             | - 49             | - 71             | - 85             | - 88             | - 80             | - 61             |
| 160    | - 61             | - 57             | - 45             | - 29             | - 9              | + 1              | + 31             | + 48             | + 58             | + 61             | + 55             | + 44             | + 26             | + 6              | - 14             | - 33             | - 49             | - 59             | - 61             | - 55             | - 42             |
| 170    | - 32             | - 30             | - 25             | - 15             | - 5              | + 6              | + 16             | + 26             | + 31             | + 32             | + 30             | + 24             | + 13             | + 3              | - 7              | - 17             | - 26             | - 31             | - 32             | - 29             | - 2              |
| 180    | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                |
| 190    | + 8              | + 26             | + 0              | + 14             | + 5              | - 6              | - 16             | - 1              | - 26             | - 8              | - 25             | 20               | - 13             | - 3              | + 7              | + 17             | + 22             | + 7              | + 27             | + 25             | + 19             |
| 200    | + 56             | + 5              | + 43             | + 28             | + 9              | - 11             | - 31             | - 45             | - 53             | - 56             | - 51             | - 41             | - 26             | - 6              | + 14             | + 33             | + 46             | + 54             | + 56             | + 50             | + 40             |
| 210    | + 84             | + 78             | + 64             | + 42             | + 13             | - 17             | - 45             | - 66             | - 80             | - 84             | - 77             | - 61             | - 38             | - 9              | + 21             | + 48             | + 67             | + 81             | + 83             | + 75             | + 59             |
| 220    | + 108            | + 101            | + 83             | + 54             | + 17             | - 2              | - 58             | - 57             | - 13             | - 108            | - 99             | - 79             | - 49             | - 12             | + 27             | + 62             | + 88             | + 104            | + 108            | + 98             | + 76             |
| 230    | + 132            | + 123            | + 100            | + 64             | + 20             | - 6              | - 70             | - 104            | - 126            | - 132            | - 121            | 96               | - 59             | - 14             | + 32             | + 74             | + 107            | + 127            | + 131            | + 119            | + 92             |
| 240    | + 149            | + 140            | + 113            | + 73             | + 3              | - 9              | - 79             | - 117            | - 14             | - 149            | - 137            | - 109            | - 67             | - 16             | + 36             | + 84             | + 121            | + 144            | + 148            | + 135            | + 105            |
| 250    | + 16             | + 15             | + 123            | + 79             | + 5              | - 32             | - 86             | - 128            | - 155            | - 162            | - 149            | - 118            | - 73             | - 18             | + 39             | + 91             | + 132            | + 157            | + 161            | + 146            | + 114            |
| 260    | + 171            | + 160            | + 19             | + 83             | + 6              | - 33             | - 90             | - 134            | - 163            | - 171            | - 157            | - 125            | - 77             | - 19             | + 41             | + 96             | + 138            | + 165            | + 170            | + 154            | + 120            |
| 270    | + 174            | + 163            | + 132            | + 85             | + 7              | - 34             | - 92             | - 137            | - 166            | - 174            | - 160            | - 117            | - 78             | - 19             | + 4              | + 98             | + 141            | + 168            | + 173            | + 157            | + 12             |
| 280    | + 17             | + 161            | + 131            | + 84             | + 7              | - 34             | - 91             | - 135            | - 164            | - 17             | - 158            | - 116            | - 77             | - 19             | + 42             | + 97             | + 139            | + 166            | + 171            | + 155            | + 121            |
| 290    | + 165            | + 155            | + 115            | + 81             | + 6              | - 3              | - 87             | - 130            | - 158            | - 165            | - 15             | - 11             | - 74             | - 18             | + 4              | + 93             | + 134            | + 159            | + 164            | + 149            | + 116            |
| 300    | + 153            | + 144            | + 116            | + 75             | + 4              | - 30             | - 81             | - 111            | - 146            | - 153            | - 141            | - 11             | - 69             | - 17             | + 37             | + 86             | + 124            | + 148            | + 152            | + 138            | + 117            |
| 310    | + 137            | + 128            | + 104            | + 67             | + 1              | - 7              | - 7              | - 108            | - 131            | - 137            | - 126            | - 100            | - 61             | - 15             | + 33             | + 77             | + 111            | + 132            | + 136            | + 124            | + 96             |
| 320    | + 117            | + 109            | + 88             | + 57             | + 18             | - 3              | - 6              | - 92             | - 111            | - 117            | - 107            | - 85             | - 52             | - 13             | + 8              | + 66             | + 94             | + 113            | + 116            | + 105            | + 8              |
| 330    | + 95             | + 89             | + 71             | + 45             | + 14             | - 18             | - 49             | - 74             | - 91             | - 95             | - 87             | - 69             | - 42             | - 10             | + 22             | + 52             | + 76             | + 92             | + 94             | + 86             | + 66             |
| 340    | + 68             | + 54             | + 51             | + 33             | + 10             | - 13             | - 36             | - 54             | - 65             | - 68             | - 63             | - 49             | - 30             | - 7              | + 16             | + 38             | + 56             | + 66             | + 68             | + 62             | + 47             |
| 350    | + 40             | + 37             | + 30             | + 18             | + 6              | - 7              | - 0              | - 31             | - 38             | 40               | - 37             | 28               | - 17             | - 4              | + 9              | + 32             | + 38             | + 39             | + 36             | + 27             |                  |
| 360    | + 10             | + 10             | + 7              | + 5              | + 1              | - 2              | - 5              | - 7              | - 10             | - 10             | - 10             | - 7              | - 5              | - 1              | + 3              | + 6              | + 9              | + 10             | + 10             | + 9              | + 8              |
| 370    | - 0              | - 18             | - 15             | - 10             | - 3              | + 4              | + 11             | + 15             | + 19             | + 0              | + 18             | + 15             | + 10             | + 2              | - 5              | - 11             | - 17             | - 19             | - 20             | - 18             | - 14             |
| 380    | - 49             | - 46             | - 38             | - 4              | - 8              | + 1              | + 26             | + 39             | + 46             | + 49             | + 45             | + 36             | + 23             | + 6              | - 12             | - 28             | - 39             | - 47             | - 49             | - 44             | - 35             |
| 390    | - 77             | - 72             | - 59             | - 37             | - 12             | + 15             | + 41             | + 61             | + 73             | + 77             | + 70             | + 56             | + 35             | + 9              | - 19             | - 43             | - 62             | - 74             | - 76             | - 69             | - 54             |
| 400    | - 102            | - 95             | - 78             | - 51             | - 16             | + 0              | + 55             | + 81             | + 97             | + 10             | + 94             | + 75             | + 47             | + 11             | - 5              | - 59             | - 83             | - 98             | - 101            | - 9              | - 72             |

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# SATELLITE II

## Tables of the Phenomena

LXVI

Corrections for Phase

Sh., Tr.

| 1                                     | 2          | 3                                    | 4                               | 5                                | 6                               |
|---------------------------------------|------------|--------------------------------------|---------------------------------|----------------------------------|---------------------------------|
| Additional Equation of Semi-duration. | <i>p</i>   | Correcting Factor for Semi-duration. | $\Delta$<br>0 <sup>d</sup> .001 | Correcting Factor for Reduction. | $\Delta$<br>0 <sup>d</sup> .001 |
| d<br>0.000000                         | d<br>0.000 | .00000                               | 0                               | .0000                            | 0                               |
| 0                                     | .002       | — 1                                  | — 1                             | 0                                | 0                               |
| 0                                     | .004       | 3                                    | 1                               | — 1                              | 0                               |
| 0                                     | .006       | 6                                    | 2                               | 1                                | 0                               |
| 0                                     | .008       | 10                                   | 3                               | 2                                | — 1                             |
| 0                                     | .010       | 16                                   | 3                               | 3                                | 1                               |
| 0.000000                              | 0.012      | — .00023                             | — 4                             | — .0005                          | — 1                             |
| 0                                     | .014       | 31                                   | 4                               | 6                                | 1                               |
| 0                                     | .016       | 40                                   | 5                               | 8                                | 1                               |
| 0                                     | .018       | 51                                   | 6                               | 10                               | 1                               |
| 0                                     | .020       | 64                                   | 7                               | 13                               | 1                               |
| 0.000000                              | 0.022      | — .00077                             | — 7                             | — .0015                          | — 1                             |
| 0                                     | .024       | 91                                   | 8                               | 18                               | 1                               |
| 0                                     | .026       | 107                                  | 8                               | 21                               | 2                               |
| 0                                     | .028       | 124                                  | 9                               | 25                               | 2                               |
| 0                                     | .030       | 143                                  | 10                              | 28                               | 2                               |
| 0.000001                              | 0.032      | — .00162                             | — 10                            | — .0032                          | — 2                             |
| I                                     | .034       | 182                                  | 11                              | 36                               | 2                               |
| I                                     | .036       | 205                                  | 12                              | 41                               | 2                               |
| I                                     | .038       | 229                                  | 12                              | 45                               | 2                               |
| I                                     | .040       | 253                                  | 12                              | 50                               | 2                               |
| 0.000001                              | 0.042      | — .00278                             | — 13                            | — .0055                          | — 3                             |
| I                                     | .044       | 306                                  | 14                              | 61                               | 3                               |
| I                                     | .046       | 335                                  | 15                              | 66                               | 3                               |
| I                                     | .048       | 364                                  | 15                              | 72                               | 3                               |
| I                                     | .050       | 395                                  | 16                              | 79                               | 3                               |
| 0.000001                              | 0.052      | — .00428                             | — 17                            | — .0085                          | — 3                             |
| I                                     | .054       | 461                                  | 17                              | 92                               | 3                               |
| 2                                     | .056       | 496                                  | 18                              | 99                               | 3                               |
| 2                                     | .058       | 531                                  | 18                              | 106                              | 4                               |
| 2                                     | .060       | 568                                  | 19                              | 113                              | 4                               |
| 0.000002                              | 0.062      | — .00607                             | — 20                            | — .0121                          | — 4                             |
| 0.000002                              | 0.064      | — .00646                             | — 20                            | — .0129                          | — 4                             |

| 1                                     | 2          | 3                                    | 4                               | 5                                | 6                               |
|---------------------------------------|------------|--------------------------------------|---------------------------------|----------------------------------|---------------------------------|
| Additional Equation of Semi-duration. | <i>p</i>   | Correcting Factor for Semi-duration. | $\Delta$<br>0 <sup>d</sup> .001 | Correcting Factor for Reduction. | $\Delta$<br>0 <sup>d</sup> .001 |
| 0.000002                              | d<br>0.064 | — .00646                             | — 20                            | — .0129                          | — 4                             |
| 2                                     | .066       | 688                                  | 21                              | 138                              | 4                               |
| 2                                     | .068       | 730                                  | 21                              | 146                              | 4                               |
| 3                                     | .070       | 773                                  | 22                              | 155                              | 4                               |
| 3                                     | .072       | 818                                  | 23                              | 164                              | 5                               |
| 3                                     | .074       | 865                                  | 24                              | 173                              | 5                               |
| 0.000003                              | 0.076      | — .00912                             | — 24                            | — .0183                          | — 5                             |
| 3                                     | .078       | 960                                  | 24                              | 193                              | 5                               |
| 3                                     | .080       | 1009                                 | 25                              | 203                              | 5                               |
| 4                                     | .082       | 1061                                 | 26                              | 214                              | 5                               |
| 4                                     | .084       | 1113                                 | 26                              | 224                              | 5                               |
| 0.000004                              | 0.086      | — .01166                             | — 27                            | — .0235                          | — 6                             |
| 4                                     | .088       | 1221                                 | 28                              | 246                              | 6                               |
| 4                                     | .090       | 1278                                 | 29                              | 258                              | 6                               |
| 5                                     | .092       | 1335                                 | 29                              | 270                              | 6                               |
| 5                                     | .094       | 1393                                 | 29                              | 281                              | 6                               |
| 0.000005                              | 0.096      | — .01452                             | — 30                            | — .0293                          | — 6                             |
| 5                                     | .098       | 1514                                 | 31                              | 306                              | 6                               |
| 6                                     | .100       | 1576                                 | 31                              | 319                              | 6                               |
| 6                                     | .102       | 1639                                 | 32                              | 332                              | 7                               |
| 6                                     | .104       | 1703                                 | 33                              | 345                              | 7                               |
| 0.000006                              | 0.106      | — .01770                             | — 34                            | — .0360                          | — 7                             |
| 7                                     | .108       | 1837                                 | 34                              | 374                              | 7                               |
| 7                                     | .110       | 1905                                 | 35                              | 388                              | 7                               |
| 7                                     | .112       | 1975                                 | 36                              | 402                              | 8                               |
| 7                                     | .114       | 2047                                 | 36                              | 418                              | 8                               |
| 0.000008                              | 0.116      | — .02118                             | — 36                            | — .0433                          | — 8                             |
| 8                                     | .118       | 2191                                 | 37                              | 448                              | 8                               |
| 8                                     | .120       | 2265                                 | 37                              | 464                              | 8                               |
| 8                                     | .122       | 2340                                 | 38                              | 480                              | 8                               |
| 8                                     | .124       | 2417                                 | 39                              | 496                              | 8                               |
| 0.000008                              | 0.126      | — .02497                             | — 40                            | — .0513                          | — 8                             |
| 0.000008                              | 0.128      | — .02578                             | — 41                            | — .0530                          | — 8                             |

The Argument is the Annual Parallax *p* as computed from the Approximate Tables IV, V, VI.

No Constant has been added to Column 1, which gives an Additional Equation of the Semiduration. Columns 3 and 5 must be multiplied respectively into the Semiduration as taken from Tables L-LVI, and the Reduction as taken from Tables LVII-LXV, and the products taken as further corrections to these quantities.

When *p* is positive, these corrections apply to *Ingress* for the Shadow and *Egress* for Transit of Disc; when *p* is negative, they apply to *Egress* for the Shadow and *Ingress* for Transit of Disc.

# SATELLITE II

## Tables of the Phenomena

### Progress of an Eclipse

#### LXVII

#### Standard Light Curve of Eclipse

| 7   | Magn tude | h   | Mag itude |
|-----|-----------|-----|-----------|
| -30 | 00        | 00  | 75        |
| 28  | 01        | +02 | 85        |
| 26  | 0         | 04  | 98        |
| 24  | 04        | 06  | 114       |
| 22  | 06        | 08  | 131       |
| 20  | 08        | 10  | 148       |
| -18 | 011       | +12 | 166       |
| 16  | 16        | 14  | 188       |
| 14  | 21        | 16  | 16        |
| 12  | 27        | 18  | 251       |
| 10  | 32        | 20  | 92        |
| -08 | 039       | +22 | 35        |
| 06  | 47        | 24  | 370       |
| 04  | 56        | 26  | 436       |
| -02 | 66        | 28  | 539       |
| 00  | 075       | +30 | 599       |

Th C di t k tl f tl m ltipl f th di f th  
S hi h i t ff by J pit m f mtl C t f th  
S t lit

#### LXVIII

#### Mean Motion in Light Curve

| Lat tude | $\Delta$ / for 1 | I at tude |
|----------|------------------|-----------|
| 00       | 0158             | 140       |
| 02       | 163              | 138       |
| 04       | 167              | 136       |
| 06       | 171              | 134       |
| 08       | 175              | 132       |
| 10       | 179              | 130       |
| 12       | 018              | 128       |
| 14       | 186              | 126       |
| 16       | 189              | 124       |
| 18       | 19               | 122       |
| 20       | 195              | 120       |
| 22       | 0198             | 118       |
| 24       | 200              | 116       |
| 26       | 203              | 114       |
| 28       | 205              | 112       |
| 30       | 207              | 110       |
| 32       | 0209             | 108       |
| 34       | 11               | 106       |
| 36       | 13               | 104       |
| 38       | 215              | 102       |
| 40       | 217              | 100       |
| 42       | 0218             | 098       |
| 44       | 0                | 096       |
| 46       | 21               | 094       |
| 48       | 22               | 092       |
| 50       | 223              | 090       |
| 52       | 0224             | 088       |
| 54       | 25               | 086       |
| 56       | 226              | 084       |
| 58       | 227              | 082       |
| 60       | 227              | 080       |
| 62       | 0228             | 078       |
| 64       | 28               | 076       |
| 66       | 28               | 074       |
| 68       | 28               | 072       |
| 70       | 29               | 070       |

#### LXIX

#### Equation of Motion

| Variation | Correction |
|-----------|------------|
| -02       | +0002      |
| -01       | +1         |
| 00        | 0          |
| +01       | -1         |
| +02       | -000       |

Th Ag m ti th V i  
ti l i d f m i bl  
XXXIII XXXVI tl 0  
ti i t b ppli lt tl  
Eq tl i f l l l XVIII

Th V l ity f k p  
d i l f l l l l XVIII  
t d ly T l l l l l l  
t b t k w i l l g  
+ f D i p p  
f R p p a r



# SATELLITE III

—

Approximate Tables

of

Heliocentric and Geocentric Conjunction

# SATELLITE III

## Approximate Tables of Conjunction

### I Epochs for Approximate Conjunction

| 1            | 2                   | 3                              | 4                   | 5                              | 6                   | 7                | 8                 | 9                 | 10                | 11                |   |
|--------------|---------------------|--------------------------------|---------------------|--------------------------------|---------------------|------------------|-------------------|-------------------|-------------------|-------------------|---|
| Year         | Conjunction         | Variation for 100 <sup>d</sup> | $\alpha$            | Variation for 100 <sup>d</sup> | $\beta$             | $\gamma$         | $\delta$          | $\epsilon$        | $\zeta$           | $\eta$            |   |
| <b>1850</b>  | <sup>d</sup> 3'3152 | + 0,5                          | <sup>d</sup> 1788'5 | '0                             | <sup>d</sup> 335'59 | <sup>d</sup> 2'8 | <sup>d</sup> 1'88 | <sup>d</sup> 5'97 | <sup>d</sup> 5'27 | <sup>d</sup> 3'95 | The constant $-0^d.1300$ has been applied to each entry in column 2, and $-0^d.12$ to each entry in columns 6-11.   |
| <b>1851</b>  | 3'8012              | 0,8                            | 2154'1              | + '1                           | 302'19              | 3'0              | 0'71              | 6'52              | 5'86              | 4'55              |   |
| <b>*1852</b> | 4'2872              | + 0,5                          | 2519'8              | '0                             | 268'79              | 3'2              | 6'60              | 7'08              | 6'45              | 5'15              |   |
| <b>1853</b>  | 3'7732              | 0,0                            | 2885'4              | '0                             | 235'39              | 3'4              | 5'44              | 0'48              | 7'04              | 5'76              |   |
| <b>1854</b>  | 4'2589              | + 0,5                          | 3250'9              | '0                             | 201'99              | 3'7              | 4'28              | 1'03              | 0'48              | 6'36              |   |
| <b>1855</b>  | 4'7449              | - 1,4                          | 3616'5              | - '1                           | 168'59              | 3'9              | 3'12              | 1'58              | 1'07              | 6'96              |   |
| <b>*1856</b> | 5'2301              | 0,0                            | 3981'7              | '0                             | 135'20              | 4'1              | 1'95              | 2'14              | 1'66              | 0'41              |   |
| <b>1857</b>  | 4'7159              | - 0,5                          | 14'5                | '0                             | 101'80              | 4'3              | 0'79              | 2'69              | 2'25              | 1'02              |   |
| <b>1858</b>  | 5'2014              | 0,0                            | 379'9               | '0                             | 68'40               | 4'6              | 6'68              | 3'24              | 2'84              | 1'62              |   |
| <b>1859</b>  | 5'6871              | + 0,5                          | 745'4               | '0                             | 35'00               | 4'8              | 5'52              | 3'80              | 3'43              | 2'22              |   |
| <b>*1860</b> | 6'1731              | 0,8                            | 1111'0              | + '1                           | 1'60                | 5'0              | 4'35              | 4'35              | 4'02              | 2'83              | Column 2 corrected by the equations from the following tables, gives superior conjunction as required for Eclipses and Occultations. To find inferior conjunction for Shadows and Transits, add (or subtract) one half the synodic period, $3^d.5832$ , to the entries in each of the columns 2, 4, 6-11. |
| <b>1861</b>  | 5'6591              | + 1,4                          | 1476'7              | + '1                           | 367'09              | 5'3              | 3'19              | 4'90              | 4'61              | 3'43              |   |
| <b>1862</b>  | 6'1454              | 0,0                            | 1842'4              | '0                             | 333'69              | 5'5              | 2'03              | 5'46              | 5'20              | 4'03              |   |
| <b>1863</b>  | 6'6311              | - 1,4                          | 2207'9              | - '1                           | 300'29              | 5'7              | 0'87              | 6'01              | 5'79              | 4'64              |   |
| <b>*1864</b> | 7'1164              | 2,7                            | 2573'1              | - '2                           | 266'89              | 5'9              | 6'76              | 6'56              | 6'38              | 5'24              |   |
| <b>1865</b>  | 6'6011              | 2,2                            | 2938'0              | - '1                           | 233'50              | 6'2              | 5'59              | 7'12              | 6'97              | 5'84              |   |
| <b>1866</b>  | 7'0861              | - 4,1                          | 3303'0              | - '2                           | 200'09              | 6'4              | 4'43              | 0'51              | 0'40              | 6'45              |   |
| <b>1867</b>  | 0'4039              | - 1,4                          | 3660'4              | - '1                           | 159'53              | 364'7            | 3'15              | 1'06              | 0'98              | 7'03              |   |
| <b>*1868</b> | 0'8892              | 0,0                            | 4025'7              | '0                             | 126'14              | 364'9            | 1'99              | 1'61              | 1'57              | 0'49              |   |
| <b>1869</b>  | 0'3749              | + 1,9                          | 58'6                | + '1                           | 92'74               | 365'2            | 0'83              | 2'17              | 2'16              | 1'09              |   |
| <b>1870</b>  | 0'8614              | 3,0                            | 424'5               | + '2                           | 59'34               | 0'1              | 6'72              | 2'72              | 2'75              | 1'70              |   |
| <b>1871</b>  | 1'3482              | + 3,6                          | 790'6               | + '2                           | 25'94               | 0'3              | 5'55              | 3'27              | 3'34              | 2'30              |   |
| <b>*1872</b> | 1'8352              | 2,7                            | 1156'9              | + '2                           | 391'43              | 0'6              | 4'39              | 3'83              | 3'93              | 2'90              |   |
| <b>1873</b>  | 1'3220              | + 1,4                          | 1523'0              | + '1                           | 358'03              | 0'8              | 3'23              | 4'38              | 4'52              | 3'51              |   |
| <b>1874</b>  | 1'8083              | - 0,3                          | 1888'8              | '0                             | 324'63              | 1'0              | 2'07              | 4'93              | 5'11              | 4'11              |   |
| <b>1875</b>  | 2'2939              | 2,7                            | 2254'2              | - '2                           | 291'23              | 1'3              | 0'90              | 5'49              | 5'70              | 4'71              |   |
| <b>*1876</b> | 2'7787              | - 3,3                          | 2619'1              | - '2                           | 257'83              | 1'5              | 6'79              | 6'04              | 6'29              | 5'32              |   |
| <b>1877</b>  | 2'2632              | 2,5                            | 2983'9              | - '2                           | 224'44              | 1'7              | 5'63              | 6'59              | 6'88              | 5'92              |   |
| <b>1878</b>  | 2'7479              | 2,7                            | 3348'6              | - '2                           | 191'04              | 1'9              | 4'47              | 7'15              | 0'32              | 6'52              |   |
| <b>1879</b>  | 3'2326              | - 0,5                          | 3713'5              | '0                             | 157'64              | 2'2              | 3'30              | 0'54              | 0'91              | 7'12              |   |
| <b>*1880</b> | 3'7182              | + 1,4                          | 4078'9              | + '1                           | 124'24              | 2'4              | 2'14              | 1'10              | 1'50              | 0'58              |   |
| <b>1881</b>  | 3'2044              | + 2,7                          | 112'1               | + '2                           | 90'84               | 2'6              | 0'98              | 1'65              | 2'09              | 1'18              |   |
| <b>1882</b>  | 3'6912              | 2,7                            | 478'2               | + '2                           | 57'45               | 2'8              | 6'87              | 2'20              | 2'68              | 1'78              |   |
| <b>1883</b>  | 4'1779              | 1,6                            | 844'3               | + '1                           | 24'05               | 3'1              | 5'71              | 2'76              | 3'27              | 2'39              |   |
| <b>*1884</b> | 4'6643              | + 0,5                          | 1210'2              | '0                             | 389'53              | 3'3              | 4'54              | 3'31              | 3'86              | 2'99              |   |
| <b>1885</b>  | 4'1502              | - 0,8                          | 1575'8              | - '1                           | 356'13              | 3'5              | 3'38              | 3'86              | 4'45              | 3'59              |   |
| <b>1886</b>  | 4'6356              | - 1,9                          | 1941'0              | - '1                           | 322'74              | 3'7              | 2'22              | 4'42              | 5'04              | 4'20              |   |
| <b>1887</b>  | 5'1207              | 1,6                            | 2306'1              | - '1                           | 289'34              | 4'0              | 1'06              | 4'97              | 5'63              | 4'80              |   |
| <b>*1888</b> | 5'6058              | 1,4                            | 2671'2              | - '1                           | 255'94              | 4'2              | 6'94              | 5'52              | 6'22              | 5'40              |   |
| <b>1889</b>  | 5'0911              | - 0,5                          | 3036'4              | '0                             | 222'54              | 4'4              | 5'78              | 6'08              | 6'81              | 6'01              |   |
| <b>1890</b>  | 5'5766              | + 1,4                          | 3401'8              | + '1                           | 189'14              | 4'6              | 4'62              | 6'63              | 0'24              | 6'61              |   |
| <b>1891</b>  | 6'0629              | + 1,9                          | 3767'6              | + '1                           | 155'75              | 4'9              | 3'46              | 0'03              | 0'83              | 0'06              |   |
| <b>*1892</b> | 6'5493              | 1,6                            | 4133'4              | + '1                           | 122'35              | 5'1              | 2'29              | 0'58              | 1'42              | 0'66              |   |
| <b>1893</b>  | 6'0357              | 1,9                            | 166'7               | + '1                           | 88'95               | 5'3              | 1'13              | 1'14              | 2'01              | 1'27              |   |
| <b>1894</b>  | 6'5221              | + 0,8                          | 532'6               | + '1                           | 55'55               | 5'5              | 7'02              | 1'69              | 2'60              | 1'87              |   |
| <b>1895</b>  | 7'0082              | - 0,5                          | 898'3               | '0                             | 22'15               | 5'8              | 5'86              | 2'24              | 3'19              | 2'47              |   |
| <b>*1896</b> | 0'3273              | - 0,8                          | 1256'5              | - '1                           | 380'47              | 364'1            | 4'58              | 2'78              | 3'77              | 3'07              |   |
| <b>1897</b>  | 6'9792              | 1,9                            | 1629'0              | - '1                           | 354'23              | 6'2              | 3'54              | 3'35              | 4'37              | 3'68              |   |
| <b>1898</b>  | 0'2978              | 1,1                            | 1986'9              | - '1                           | 313'68              | 364'5            | 2'25              | 3'89              | 4'95              | 4'27              |   |
| <b>1899</b>  | 0'7832              | - 1,1                          | 2352'1              | - '1                           | 280'28              | 364'8            | 1'09              | 4'44              | 5'54              | 4'88              |   |
| <b>1900</b>  | 1'2685              | + 0,5                          | 2717'4              | '0                             | 246'88              | 365'0            | 6'98              | 5'00              | 6'13              | 5'48              |   |
| Period       | 7'1664              | ...                            | 4332'6              | ...                            | 398'88              | 365'3            | 7'05              | 7'16              | 7'15              | 7'15              |   |

# SATELLITE III

## Approximate Tables of Conjunction

I continued

Epochs for Approximate Conjunction

| Year  | Conjunction | V to<br>from 100 <sup>d</sup> | $\alpha$ | V ation<br>from 100 <sup>d</sup> | $\beta$ | $\gamma$ | $\delta$ | $\epsilon$ | $\zeta$ | $\eta$ |  |
|-------|-------------|-------------------------------|----------|----------------------------------|---------|----------|----------|------------|---------|--------|--|
| 1900  | 1 685       | + 05                          | 717 4    |                                  | 246 88  | 365      | 698      | 50         | 6 13    | 5 48   | <p>The constant <math>-0^d 1300</math> has been applied to each entry in column and <math>-0^d 12</math> to each entry in columns 6 11</p> <p>Column 2 corrected by the equations of the following tables gives superior conjunctions required for eclipses and Occultations. To find inferior conjunction for Shadows and Transits add (or subtract) one half the synodic period <math>3^d 58.3</math> to the entries in each of the columns 2 4 6-11</p> |
| 1901  | 1 7545      | 14                            | 30830    | + 1                              | 213 48  | 0        | 5 82     | 5 55       | 6 7     | 6 8    |  |
| 1902  | 2 407       | + 08                          | 34487    | + 1                              | 180 08  |          | 4 66     | 6 11       | 0 16    | 6 69   |  |
| 1903  | 2 7 68      | 00                            | 38144    | 0                                | 146 69  | 04       | 3 49     | 6 66       | 0 75    | 0 14   |  |
| 1904  | 3 1 5       | - 05                          | 41799    | 0                                | 113 9   | 06       | 33       | 0 06       | 1 34    | 0 74   |  |
| 1905  | 6981        | 08                            | 1 7      | - 1                              | 79 89   | 09       | 1 17     | 0 61       | 1 93    | 1 34   |  |
| 1906  | 3 1835      | - 08                          | 5780     | - 1                              | 46 49   | 11       | 0 01     | 1 16       | 5       | 1 95   |  |
| 1907  | 3 6690      | - 05                          | 9433     | 0                                | 13 09   | 13       | 5 89     | 17         | 3 11    | 2 55   |  |
| 1908  | 4 1445      | 00                            | 13 86    | 0                                | 378 58  | 16       | 4 73     | 7          | 3 70    | 3 15   |  |
| 1909  | 3 6403      | 00                            | 16741    | 0                                | 345 18  | 18       | 3 57     | 8          | 4 9     | 3 76   |  |
| 1910  | 4 1 60      | + 11                          | 0396     | + 1                              | 311 8   |          | 2 41     | 3 38       | 4 88    | 4 36   |  |
| 1911  | 4 61        | + 03                          | 4053     | 0                                | 278 38  | 2        | 1 24     | 3 93       | 5 47    | 4 96   |  |
| 1912  | 5 0980      | + 05                          | 77 9     | 0                                | 244 99  | 25       | 0 08     | 4 48       | 6 06    | 5 57   |  |
| 1913  | 4 5840      | 0                             | 31365    | 0                                | 211 59  | 7        | 5 97     | 5 04       | 6 65    | 6 17   |  |
| 1914  | 5 0697      | - 08                          | 35 0     | - 1                              | 178 1   | 29       | 4 81     | 5 59       | 0 08    | 6 77   |  |
| 1915  | 5 5551      | 11                            | 38673    | - 1                              | 144 79  | 31       | 3 65     | 6 14       | 0 67    | 0 2    |  |
| 1916  | 6 0405      | - 14                          | 4 3 5    | - 1                              | 111 39  | 34       | 2 48     | 6 70       | 1 6     | 0 83   | <p>The constant <math>-0^d 1300</math> has been applied to each entry in column and <math>-0^d 12</math> to each entry in columns 6 11</p> <p>Column 2 corrected by the equations of the following tables gives superior conjunctions required for eclipses and Occultations. To find inferior conjunction for Shadows and Transits add (or subtract) one half the synodic period <math>3^d 58.3</math> to the entries in each of the columns 2 4 6-11</p> |
| 1917  | 5 5257      | 00                            | 65 1     | 0                                | 78 00   | 36       | 1 3      | 0 10       | 1 85    | 1 43   |  |
| 1918  | 6 115       | + 05                          | 6306     | 0                                | 44 60   | 38       | 0 16     | 0 65       | 44      | 2 03   |  |
| 1919  | 6 4974      | 08                            | 996      | + 1                              | 11 20   | 40       | 6 05     | 1 0        | 3 03    | 64     |  |
| 1920  | 6 9835      | 14                            | 13619    | + 1                              | 376 68  | 43       | 4 89     | 1 75       | 3 6     | 3 24   |  |
| 1921  | 6 4697      | + 19                          | 17277    | + 1                              | 343 9   | 45       | 3 2      | 2 31       | 4 21    | 3 85   |  |
| 1922  | 6 956       | - 19                          | 0936     | - 1                              | 309 88  | 47       | 2 56     | 86         | 4 80    | 4 45   |  |
| 1923  | 748         | 03                            | 4515     |                                  | 693     | 3630     | 1 28     | 3 40       | 5 38    | 5 04   |  |
| 1924  | 7605        | 33                            | 28169    | -                                | 35 93   | 3633     | 0 1      | 3 96       | 5 97    | 5 64   |  |
| 1925  | 0 245       | 36                            | 31816    | - 2                              | 202 53  | 3635     | 6 01     | 4 51       | 6 56    | 6 25   |  |
| 1926  | 0 7 95      | - 33                          | 35463    | - 2                              | 169 13  | 3637     | 4 84     | 5 06       | 7 14    | 6 85   |  |
| 1927  | 1 2140      | - 14                          | 39111    | - 1                              | 135 73  | 3639     | 3 68     | 5 62       | 0 58    | 0 30   |  |
| *1928 | 1 6993      | + 5                           | 4 763    | 0                                | 10 33   | 3642     | 2 5      | 6 17       | 1 17    | 0 90   |  |
| 1929  | 185         | 27                            | 3093     | + 2                              | 68 93   | 3644     | 1 36     | 6 73       | 1 76    | 1 51   |  |
| 1930  | 1 67        | 30                            | 6754     | + 1                              | 35 54   | 3646     | 0 0      | 0 12       | 35      | 2 11   |  |
| 1931  | 1588        | + 33                          | 10416    | +                                | 14      | 3648     | 6 08     | 0 68       | 2 94    | 71     | <p>The constant <math>-0^d 1300</math> has been applied to each entry in column and <math>-0^d 12</math> to each entry in columns 6 11</p> <p>Column 2 corrected by the equations of the following tables gives superior conjunctions required for eclipses and Occultations. To find inferior conjunction for Shadows and Transits add (or subtract) one half the synodic period <math>3^d 58.3</math> to the entries in each of the columns 2 4 6-11</p> |
| 1932  | 6458        | 7                             | 14077    | + 2                              | 36 6    | 3651     | 4 9      | 1 23       | 3 53    | 3 32   |  |
| 1933  | 13 5        | + 08                          | 17738    | + 1                              | 334 3   | 00       | 3 76     | 1 78       | 4 12    | 3 92   |  |
| 1934  | 6186        | - 08                          | 1395     | - 1                              | 300 83  | 03       | 2 60     | 34         | 4 71    | 4 52   |  |
| 1935  | 3 1 40      | 7                             | 25 48    | -                                | 267 43  | 05       | 1 43     | 89         | 5 30    | 5 13   |  |
| *1936 | 3 5888      | - 36                          | 8697     | -                                | 34 03   | 7        | 0 7      | 3 44       | 5 89    | 5 73   |  |
| 1937  | 3 73        | 36                            | 3 344    | - 2                              | 200 63  | 09       | 6 16     | 4 00       | 6 48    | 6 34   |  |
| 1938  | 3 5577      | 19                            | 35991    | - 1                              | 167 24  | 12       | 5 0      | 4 55       | 7 07    | 6 94   |  |
| 1939  | 4 4 7       | - 05                          | 39641    | 0                                | 133 84  | 14       | 3 83     | 5 10       | 51      | 0 39   |  |
| 1940  | 4 5 83      | + 19                          | 43 95    | + 1                              | 100 44  | 16       | 67       | 5 66       | 1 10    | 0 99   |  |
| 1941  | 4 147       | + 7                           | 3628     | +                                | 67 4    | 18       | 1 51     | 6 21       | 1 69    | 1 59   |  |
| 1942  | 4 5 14      | 2                             | 7 89     | + 1                              | 33 64   | 21       | 0 35     | 6 6        | 2 28    | 2 20   |  |
| 1943  | 4 9880      | + 14                          | 10949    | + 1                              | 24      | 23       | 6 24     | 0 16       | 2 87    | 2 80   |  |
| 1944  | 5 4742      | 00                            | 146 7    | 0                                | 365 73  | 25       | 5 07     | 0 72       | 3 46    | 3 41   |  |
| 1945  | 4 9600      | - 08                          | 18 62    | - 1                              | 33 33   | 28       | 3 91     | 1 27       | 4 05    | 4 01   |  |
| 1946  | 5 4454      | - 16                          | 1914     | - 2                              | 298 93  | 30       | 75       | 1 82       | 4 64    | 4 61   | <p>The constant <math>-0^d 1300</math> has been applied to each entry in column and <math>-0^d 12</math> to each entry in columns 6 11</p> <p>Column 2 corrected by the equations of the following tables gives superior conjunctions required for eclipses and Occultations. To find inferior conjunction for Shadows and Transits add (or subtract) one half the synodic period <math>3^d 58.3</math> to the entries in each of the columns 2 4 6-11</p> |
| 1947  | 5 9306      | 16                            | 5565     | - 1                              | 265 54  | 3        | 1 59     | 2 38       | 5 23    | 5 2    |  |
| 1948  | 6 4157      | - 08                          | 9 17     | - 1                              | 3 14    | 34       | 0 4      | 2 93       | 5 82    | 5 82   |  |
| 1949  | 5 901       | 00                            | 3 87     | 0                                | 198 74  | 37       | 6 31     | 3 48       | 6 41    | 6 42   |  |
| 1950  | 6 3869      | + 14                          | 365 5    | + 1                              | 165 34  | 39       | 5 15     | 4 04       | 7 00    | 7 03   |  |
| P od  | 7 1664      |                               | 43326    |                                  | 398 88  | 3653     | 7 05     | 7 16       | 7 15    | 7 15   |  |

# SATELLITE III

## Approximate Tables of Conjunction

I continued

Epochs for Approximate Conjunction

| 1      | 2           | 3                              | 4        | 5                              | 6       | 7        | 8        | 9          | 10      | 11     |   |
|--------|-------------|--------------------------------|----------|--------------------------------|---------|----------|----------|------------|---------|--------|---|
| Year   | Conjunction | Variation for 100 <sup>d</sup> | $\alpha$ | Variation for 100 <sup>d</sup> | $\beta$ | $\gamma$ | $\delta$ | $\epsilon$ | $\zeta$ | $\eta$ |   |
| 1950   | 6'3869      | + 1,4                          | 3652'5   | + '1                           | 165'34  | 3'9      | 5'15     | 4'04       | 7'00    | 7'03   | <p>The constant <math>-0^d.1300</math> has been applied to each entry in column 2, and <math>-0^d.12</math> to each entry in columns 6-11.</p> <p>Column 2 corrected by the equations of the following tables, gives superior conjunction as required for Eclipses and Occultations. To find inferior conjunction for Shadows and Transits, add (or subtract) one half the synodic period, <math>3^d.5832</math>, to the entries in each of the columns 2, 4, 6-11.</p> |
| 1951   | 6'8732      | 1,4                            | 4018'3   | + '1                           | 131'94  | 4'1      | 3'99     | 4'59       | 0'44    | 0'48   |   |
| *1952  | 0'1930      | 1,6                            | 44'3     | + '1                           | 91'38   | 362'4    | 2'71     | 5'13       | 1'01    | 1'07   |   |
| 1953   | 6'8458      | 1,1                            | 417'3    | + '1                           | 65'15   | 4'6      | 1'66     | 5'70       | 1'62    | 1'68   |   |
| 1954   | 0'1655      | + 0,3                          | 775'9    | '0                             | 24'58   | 362'9    | 0'38     | 6'24       | 2'19    | 2'27   |   |
| 1955   | 0'6514      | - 0,3                          | 1141'5   | '0                             | 390'07  | 363'1    | 6'27     | 6'79       | 2'78    | 2'88   |   |
| *1956  | 1'1370      | - 1,1                          | 1506'8   | - '1                           | 356'67  | 363'3    | 5'11     | 0'19       | 3'37    | 3'48   |   |
| 1957   | 0'6224      | - 1,6                          | 1872'1   | - '1                           | 323'27  | 363'6    | 3'95     | 0'74       | 3'96    | 4'08   |   |
| 1958   | 1'1075      | - 1,1                          | 2237'2   | - '1                           | 289'87  | 363'8    | 2'79     | 1'30       | 4'55    | 4'69   |   |
| 1959   | 1'5929      | 0,0                            | 2602'5   | '0                             | 256'48  | 364'0    | 1'62     | 1'85       | 5'14    | 5'29   |   |
| *1960  | 2'0786      | + 1,1                          | 2968'0   | + '1                           | 223'08  | 364'2    | 0'46     | 2'40       | 5'73    | 5'90   |   |
| 1961   | 1'5648      | + 0,8                          | 3333'7   | + '1                           | 189'68  | 364'5    | 6'35     | 2'96       | 6'32    | 6'50   |   |
| 1962   | 2'0508      | + 0,5                          | 3699'4   | '0                             | 156'28  | 364'7    | 5'19     | 3'51       | 6'91    | 7'10   |   |
| 1963   | 2'5368      | - 0,5                          | 4064'9   | '0                             | 122'88  | 364'9    | 4'02     | 4'06       | 0'35    | 0'55   |   |
| *1964  | 3'0223      | 0,8                            | 97'8     | - '1                           | 89'48   | 365'2    | 2'86     | 4'62       | 0'94    | 1'15   |   |
| 1965   | 2'5078      | - 1,1                          | 463'1    | - '1                           | 56'09   | 0'1      | 1'70     | 5'17       | 1'53    | 1'76   |   |
| 1966   | 2'9931      | 0,0                            | 828'4    | '0                             | 22'69   | 0'3      | 0'54     | 5'72       | 2'12    | 2'36   |   |
| 1967   | 3'4789      | - 1,4                          | 1193'9   | - '1                           | 388'17  | 0'6      | 6'42     | 6'28       | 2'71    | 2'97   |   |
| *1968  | 3'9641      | + 0,5                          | 1559'1   | '0                             | 354'78  | 0'8      | 5'26     | 6'83       | 3'30    | 3'57   |   |
| 1969   | 3'4500      | 0,8                            | 1924'7   | + '1                           | 321'38  | 1'0      | 4'10     | 0'23       | 3'89    | 4'17   |   |
| 1970   | 3'9361      | 1,1                            | 2290'3   | + '1                           | 287'98  | 1'2      | 2'94     | 0'78       | 4'48    | 4'78   |   |
| 1971   | 4'4222      | + 0,3                          | 2656'0   | '0                             | 254'58  | 1'5      | 1'77     | 1'33       | 5'07    | 5'38   |   |
| *1972  | 4'9081      | + 0,5                          | 3021'6   | '0                             | 221'18  | 1'7      | 0'61     | 1'89       | 5'66    | 5'98   |   |
| 1973   | 4'3940      | - 0,8                          | 3387'2   | - '1                           | 187'79  | 1'9      | 6'50     | 2'44       | 6'25    | 6'59   |   |
| 1974   | 5'8795      | 1,4                            | 3753'5   | - '1                           | 154'39  | 2'1      | 5'34     | 3'00       | 6'84    | 0'04   |   |
| 1975   | 5'3647      | - 1,1                          | 4117'7   | - '1                           | 120'99  | 2'4      | 4'18     | 3'55       | 0'27    | 0'64   |   |
| *1976  | 5'8501      | + 1,9                          | 150'4    | + '1                           | 87'59   | 2'6      | 3'01     | 4'10       | 0'86    | 1'24   |   |
| 1977   | 5'3365      | - 3,0                          | 516'2    | - '2                           | 54'19   | 2'8      | 1'85     | 4'66       | 1'45    | 1'85   |   |
| 1978   | 5'8212      | + 0,3                          | 881'0    | '0                             | 20'79   | 3'1      | 0'69     | 5'21       | 2'04    | 2'45   |   |
| 1979   | 6'3070      | 1,9                            | 1246'6   | + '1                           | 386'28  | 3'3      | 6'58     | 5'76       | 2'63    | 3'05   |   |
| *1980  | 6'7935      | 1,6                            | 1612'5   | + '1                           | 352'88  | 3'5      | 5'41     | 6'32       | 3'22    | 3'66   |   |
| 1981   | 6'2798      | + 1,4                          | 1978'4   | + '1                           | 319'48  | 3'7      | 4'25     | 6'87       | 3'81    | 4'26   |   |
| 1982   | 6'7661      | - 0,4                          | 2244'2   | '0                             | 286'09  | 4'0      | 3'09     | 0'27       | 4'40    | 4'86   |   |
| 1983   | 0'0853      | - 2,7                          | 2702'4   | - '2                           | 245'52  | 362'3    | 1'81     | 0'81       | 4'98    | 5'46   |   |
| *1984  | 0'5701      | - 3,0                          | 3067'3   | + '1                           | 212'12  | 362'5    | 0'65     | 1'36       | 5'57    | 6'06   |   |
| 1985   | 0'0563      | - 4,1                          | 3432'1   | - '3                           | 178'72  | 362'7    | 6'54     | 1'92       | 6'16    | 6'66   |   |
| 1986   | 0'5389      | - 2,7                          | 3796'6   | - '2                           | 145'33  | 363'0    | 5'38     | 2'47       | 6'75    | 0'11   |   |
| 1987   | 1'0236      | - 0,8                          | 4161'4   | - '1                           | 111'93  | 363'2    | 4'21     | 3'02       | 0'19    | 0'72   |   |
| *1988  | 1'5091      | + 0,8                          | 194'2    | + '1                           | 78'53   | 363'4    | 3'05     | 3'58       | 0'78    | 1'32   |   |
| 1989   | 0'9952      | 2,5                            | 559'9    | + '1                           | 45'13   | 363'6    | 1'89     | 4'13       | 1'37    | 1'92   |   |
| 1990   | 1'4818      | 3,6                            | 925'9    | + '2                           | 11'73   | 363'9    | 0'73     | 4'68       | 1'96    | 2'53   |   |
| 1991   | 1'9688      | + 3,0                          | 1292'2   | + '2                           | 377'22  | 364'1    | 6'61     | 5'24       | 2'55    | 3'13   |   |
| *1992  | 2'4557      | 2,5                            | 1658'4   | + '1                           | 343'82  | 364'3    | 5'45     | 5'79       | 3'14    | 3'73   |   |
| 1993   | 1'9423      | + 0,3                          | 2024'3   | '0                             | 310'42  | 364'5    | 4'29     | 6'34       | 3'73    | 4'34   |   |
| 1994   | 2'4282      | - 1,4                          | 2389'9   | - '1                           | 277'03  | 364'8    | 3'13     | 6'90       | 4'32    | 4'94   |   |
| 1995   | 2'9134      | 3,0                            | 2755'1   | - '2                           | 243'63  | 365'0    | 1'96     | 0'29       | 4'91    | 5'54   |   |
| *1996  | 3'3980      | - 3,6                          | 3119'9   | - '2                           | 210'23  | 0'0      | 0'80     | 0'85       | 5'50    | 6'15   |   |
| 1997   | 2'8825      | 3,3                            | 3484'6   | - '2                           | 176'83  | 0'2      | 6'69     | 1'40       | 6'09    | 6'75   |   |
| 1998   | 3'3670      | - 1,9                          | 3849'4   | - '1                           | 143'43  | 0'4      | 5'53     | 1'95       | 6'68    | 0'20   |   |
| 1999   | 3'8521      | 0,0                            | 4214'5   | '0                             | 110'03  | 0'6      | 4'36     | 2'51       | 0'12    | 0'80   |   |
| *2000  | 4'3378      | ...                            | 247'3    | ...                            | 76'64   | 0'9      | 3'20     | 3'06       | 0'70    | 1'41   |   |
| Period | 7'1664      | ...                            | 4332'6   | ...                            | 398'88  | 365'3    | 7'05     | 7'16       | 7'15    | 7'15   |   |

# SATELLITE III

## Approximate Tables of Conjunction

II

Motions of the Arguments

| Syn R v | Date      | 3                     | 4        | 5    | 6       | 7      |
|---------|-----------|-----------------------|----------|------|---------|--------|
|         |           | $\alpha \beta \gamma$ | $\delta$ |      | $\zeta$ | $\eta$ |
| 1       | J nuary   | 7 1664                | 7 17     | 01   | 01      | 001    |
| 2       |           | 14 33 8               | 14 33    | 0 3  | 00      | 002    |
| 3       |           | 1 499                 | 1 50     | 0 35 | 3       | 004    |
| 4       |           | 8 6655                | 8 67     | 0 46 | 005     | 0 5    |
| 5       | February  | 4 8319                | 35 83    | 0 58 | 005     | 006    |
| 6       |           | 11 9983               | 43 0     | 0 69 | 007     | 007    |
| 7       |           | 19 1647               | 50 16    | 0 81 | 008     | 008    |
| 8       |           | 6 3311                | 57 33    | 0 9  | 009     | 009    |
| 9       | March     | 5 4975                | 64 50    | 1 04 | 1       | 011    |
| 10      |           | 1 6639                | 71 66    | 1 15 | 012     | 012    |
| 11      |           | 19 83 3               | 78 83    | 1 7  | 012     | 013    |
| 12      |           | 26 9966               | 86 00    | 1 39 | 013     | 014    |
| 13      | April     | 3 1630                | 93 16    | 1 50 | 014     | 015    |
| 14      |           | 10 3 94               | 1 0 33   | 1 6  | 015     | 017    |
| 15      |           | 17 4958               | 107 50   | 1 73 | 016     | 018    |
| 16      |           | 24 6622               | 114 66   | 1 85 | 017     | 019    |
| 17      | May       | 1 8286                | 121 83   | 1 96 | 018     | 0 0    |
| 18      |           | 8 9950                | 129 00   | 2 08 | 0 0     | 21     |
| 19      |           | 16 1614               | 136 16   | 2 19 | 0 1     | 0 2    |
| 20      |           | 3 3277                | 143 33   | 2 31 | 0 2     | 024    |
| 21      |           | 30 4941               | 150 49   | 2 42 | 0 23    | 025    |
| 22      | June      | 6 66 5                | 157 66   | 54   | 0 4     | 0 6    |
| 23      |           | 13 8 69               | 164 83   | 66   | 0 5     | 0 7    |
| 24      |           | 9933                  | 171 99   | 77   | 026     | 028    |
| 25      |           | 8 1597                | 179 16   | 89   | 0 7     | 030    |
| 26      | July      | 5 3261                | 186 33   | 3 0  | 028     | 031    |
| 27      |           | 1 49 5                | 193 49   | 3 12 | 029     | 32     |
| 28      |           | 19 6588               | 00 66    | 3 23 | 0 3     | 33     |
| 29      |           | 6 8 5                 | 07 83    | 3 35 | 032     | 034    |
| 30      | August    | 2 9916                | 14 99    | 3 46 | 033     | 036    |
| 31      |           | 10 1580               | 22 16    | 3 58 | 034     | 037    |
| 32      |           | 17 3 44               | 2 9 32   | 3 69 | 035     | 038    |
| 33      |           | 4 49 8                | 236 49   | 3 81 | 036     | 039    |
| 34      |           | 31 657                | 43 66    | 3 93 | 037     | 040    |
| 35      | September | 7 8 36                | 50 82    | 4 04 | 038     | 041    |
| 36      |           | 14 9899               | 57 99    | 4 16 | 039     | 043    |
| 37      |           | 1563                  | 265 16   | 4 27 | 04      | 044    |
| 38      |           | 9 3 7                 | 272 32   | 4 39 | 041     | 045    |
| 39      | October   | 6 4891                | 79 49    | 4 50 | 42      | 046    |
| 40      |           | 13 6555               | 86 66    | 4 62 | 043     | 047    |
| 41      |           | 0 8 19                | 293 82   | 4 73 | 045     | 049    |
| 42      |           | 7 9883                | 300 99   | 4 85 | 046     | 050    |
| 43      | November  | 4 1547                | 3 8 15   | 4 96 | 047     | 051    |
| 44      |           | 11 3 10               | 315 3    | 5 08 | 048     | 05     |
| 45      |           | 18 4874               | 3 2 49   | 5 2  | 049     | 053    |
| 46      |           | 25 6538               | 3 9 65   | 5 31 | 050     | 054    |
| 47      | December  | 8 02                  | 336 8    | 5 43 | 051     | 056    |
| 48      |           | 9 9866                | 343 99   | 5 54 | 05      | 57     |
| 49      |           | 17 1530               | 351 15   | 5 66 | 53      | 58     |
| 50      |           | 24 3194               | 358 32   | 5 77 | 054     | 059    |
| 51      |           | 31 4857               | 365 49   | 5 89 | 55      | 060    |

I L p Y d m i h t h d t O l m b y ft F b 8



## Approximate Tables of Conjunction

III                      Equation of Conjunction                      Argument  $a$                       Ec., Oc., Sh., Tr.

| 1        | 2        | 3               | 1        | 2        | 3               | 1        | 2        | 3               | 1        | 2        | 3               | 1        | 2        | 3               |
|----------|----------|-----------------|----------|----------|-----------------|----------|----------|-----------------|----------|----------|-----------------|----------|----------|-----------------|
| $\alpha$ | Equation | $\Delta_{10^d}$ | $\alpha$ | Equation | $\Delta_{10^d}$ | $\alpha$ | Equation | $\Delta_{10^d}$ | $\alpha$ | Equation | $\Delta_{10^d}$ | $\alpha$ | Equation | $\Delta_{10^d}$ |
| $d$      | $d$      |                 | $d$      | $d$      |                 | $d$      | $d$      |                 | $d$      | $d$      |                 | $d$      | $d$      |                 |
| 0        | 0°1200   | +17,0           | 1000     | 0°2301   | +1,0            | 2000     | 0°1447   | -14,8           | 3000     | 0°0193   | -6,5            | 4000     | 0°0662   | +14,8           |
| 20       | 1234     | 17,0            | 1020     | 2302     | +0,5            | 2020     | 1418     | 14,5            | 3020     | 180      | 6,0             | 4020     | 692      | 15,0            |
| 40       | 1268     | 16,8            | 1040     | 2303     | 0,0             | 2040     | 1389     | 14,8            | 3040     | 169      | 5,5             | 4040     | 722      | 15,3            |
| 60       | 1301     | 16,8            | 1060     | 2302     | -0,5            | 2060     | 1359     | 15,0            | 3060     | 158      | 5,3             | 4060     | 753      | 15,5            |
| 80       | 1335     | 17,0            | 1080     | 2301     | 0,8             | 2080     | 1329     | 15,0            | 3080     | 148      | 4,8             | 4080     | 784      | 15,5            |
| 100      | 1369     | 16,8            | 1100     | 2299     | 1,5             | 2100     | 1299     | 15,0            | 3100     | 139      | 4,3             | 4100     | 815      | 15,8            |
| 120      | 0°1402   | +16,5           | 1120     | 0°2295   | -2,0            | 2120     | 0°1269   | -15,0           | 3120     | 0°0131   | -3,8            | 4120     | 0°0847   | +16,0           |
| 140      | 1435     | 16,5            | 1140     | 2291     | 2,3             | 2140     | 1239     | 15,0            | 3140     | 124      | 3,3             | 4140     | 879      | 16,0            |
| 160      | 1468     | 16,5            | 1160     | 2286     | 2,5             | 2160     | 1209     | 15,0            | 3160     | 118      | 3,0             | 4160     | 911      | 16,3            |
| 180      | 1501     | 16,3            | 1180     | 2281     | 3,0             | 2180     | 1179     | 15,0            | 3180     | 112      | 2,8             | 4180     | 944      | 16,5            |
| 200      | 1533     | 16,0            | 1200     | 2274     | 3,8             | 2200     | 1149     | 15,0            | 3200     | 107      | 2,3             | 4200     | 977      | 16,5            |
| 220      | 0°1565   | +16,0           | 1220     | 0°2266   | -4,0            | 2220     | 0°1119   | -14,8           | 3220     | 0°0103   | -1,8            | 4220     | 0°1010   | +16,8           |
| 240      | 1597     | 15,8            | 1240     | 2258     | 4,5             | 2240     | 1090     | 14,8            | 3240     | 100      | 1,3             | 4240     | 1044     | 16,8            |
| 260      | 1628     | 15,5            | 1260     | 2248     | 5,0             | 2260     | 1060     | 15,0            | 3260     | 98       | 0,5             | 4260     | 1077     | 16,8            |
| 280      | 1659     | 15,3            | 1280     | 2238     | 5,3             | 2280     | 1030     | 15,0            | 3280     | 98       | -0,3            | 4280     | 1111     | 17,0            |
| 300      | 1689     | 15,0            | 1300     | 2227     | 5,8             | 2300     | 1000     | 14,8            | 3300     | 97       | 0,0             | 4300     | 1145     | 17,0            |
| 320      | 0°1719   | +15,0           | 1320     | 0°2215   | -6,0            | 2320     | 0°0971   | -14,5           | 3320     | 0°0098   | +0,8            | 4320     | 0°1179   | +17,0           |
| 340      | 1749     | 14,8            | 1340     | 2203     | 6,5             | 2340     | 942      | 14,5            | 3340     | 100      | 1,3             | 4340     | 1213     | 16,8            |
| 360      | 1778     | 14,3            | 1360     | 2189     | 7,0             | 2360     | 913      | 14,5            | 3360     | 103      | 1,8             | 4360     | 1246     | 16,8            |
| 380      | 1806     | 14,0            | 1380     | 2175     | 7,3             | 2380     | 884      | 14,5            | 3380     | 107      | 2,0             | 4380     | 1280     | 17,0            |
| 400      | 1834     | 13,8            | 1400     | 2160     | 7,8             | 2400     | 855      | 14,5            | 3400     | 111      | 2,5             | 4400     | 1314     | 16,8            |
| 420      | 0°1861   | +13,3           | 1420     | 0°2144   | -8,0            | 2420     | 0°0826   | -14,3           | 3420     | 0°0117   | +3,3            | 4420     | 0°1347   | +16,8           |
| 440      | 1887     | 13,0            | 1440     | 2128     | 8,3             | 2440     | 798      | 14,0            | 3440     | 124      | 3,5             | 4440     | 1381     | 16,8            |
| 460      | 1913     | 12,8            | 1460     | 2111     | 8,8             | 2460     | 770      | 13,8            | 3460     | 131      | 4,0             | 4460     | 1414     | 16,5            |
| 480      | 1938     | 12,5            | 1480     | 2093     | 9,0             | 2480     | 743      | 13,8            | 3480     | 140      | 4,5             | 4480     | 1447     | 16,5            |
| 500      | 1963     | 12,3            | 1500     | 2075     | 9,5             | 2500     | 715      | 13,8            | 3500     | 149      | 4,8             | 4500     | 1480     | 16,5            |
| 520      | 0°1987   | +11,8           | 1520     | 0°2055   | -10,0           | 2520     | 0°0688   | -13,3           | 3520     | 0°0159   | +5,5            | 4520     | 0°1513   | +16,3           |
| 540      | 2010     | 11,3            | 1540     | 2035     | 10,0            | 2540     | 662      | 13,0            | 3540     | 171      | 6,0             | 4540     | 1545     | 16,0            |
| 560      | 2032     | 10,8            | 1560     | 2015     | 10,3            | 2560     | 636      | 13,0            | 3560     | 183      | 6,3             | 4560     | 1577     | 15,8            |
| 580      | 2053     | 10,5            | 1580     | 1994     | 10,8            | 2580     | 610      | 13,0            | 3580     | 196      | 6,8             | 4580     | 1608     | 15,5            |
| 600      | 2074     | 10,3            | 1600     | 1972     | 11,0            | 2600     | 584      | 12,8            | 3600     | 210      | 7,3             | 4600     | 1639     | 15,5            |
| 620      | 0°2094   | +9,8            | 1620     | 0°1950   | -11,0           | 2620     | 0°0559   | -12,3           | 3620     | 0°0225   | +7,8            | 4620     | 0°1670   | +15,3           |
| 640      | 2113     | 9,3             | 1640     | 1928     | 11,3            | 2640     | 535      | 12,0            | 3640     | 241      | 8,3             | 4640     | 1700     | 15,0            |
| 660      | 2131     | 8,8             | 1660     | 1905     | 11,8            | 2660     | 511      | 12,0            | 3660     | 258      | 8,5             | 4660     | 1730     | 14,8            |
| 680      | 2148     | 8,3             | 1680     | 1881     | 12,3            | 2680     | 487      | 11,8            | 3680     | 275      | 9,0             | 4680     | 1759     | 14,5            |
| 700      | 2164     | 8,0             | 1700     | 1856     | 12,3            | 2700     | 464      | 11,5            | 3700     | 294      | 9,5             | 4700     | 1788     | 14,3            |
| 720      | 0°2180   | +7,8            | 1720     | 0°1832   | -12,3           | 2720     | 0°0441   | -11,3           | 3720     | 0°0313   | +9,8            | 4720     | 0°1816   | +14,0           |
| 740      | 2195     | 7,3             | 1740     | 1807     | 12,8            | 2740     | 419      | 10,8            | 3740     | 333      | 10,3            | 4740     | 1844     | 13,8            |
| 760      | 2209     | 6,8             | 1760     | 1781     | 13,0            | 2760     | 398      | 10,5            | 3760     | 354      | 10,8            | 4760     | 1871     | 13,3            |
| 780      | 2222     | 6,0             | 1780     | 1755     | 13,0            | 2780     | 377      | 10,3            | 3780     | 376      | 11,3            | 4780     | 1897     | 13,0            |
| 800      | 2233     | 5,5             | 1800     | 1729     | 13,3            | 2800     | 357      | 9,8             | 3800     | 399      | 11,5            | 4800     | 1923     | 12,8            |
| 820      | 0°2244   | +5,3            | 1820     | 0°1702   | -13,5           | 2820     | 0°0338   | -9,5            | 3820     | 0°0422   | +11,8           | 4820     | 0°1948   | +12,3           |
| 840      | 2254     | 5,0             | 1840     | 1675     | 13,8            | 2840     | 319      | 9,5             | 3840     | 446      | 12,3            | 4840     | 1972     | 11,8            |
| 860      | 2264     | 4,5             | 1860     | 1647     | 14,0            | 2860     | 300      | 9,0             | 3860     | 471      | 12,5            | 4860     | 1995     | 11,5            |
| 880      | 2272     | 3,8             | 1880     | 1619     | 14,0            | 2880     | 283      | 8,5             | 3880     | 496      | 12,8            | 4880     | 2018     | 11,3            |
| 900      | 2279     | 3,3             | 1900     | 1591     | 14,0            | 2900     | 266      | 8,3             | 3900     | 522      | 13,3            | 4900     | 2040     | 10,8            |
| 920      | 0°2285   | +2,8            | 1920     | 0°1563   | -14,3           | 2920     | 0°0250   | -8,0            | 3920     | 0°0549   | +13,5           | 4920     | 0°2061   | +10,3           |
| 940      | 2290     | 2,3             | 1940     | 1534     | 14,3            | 2940     | 234      | 7,5             | 3940     | 576      | 13,8            | 4940     | 2081     | 10,0            |
| 960      | 2294     | 2,0             | 1960     | 1506     | 14,3            | 2960     | 220      | 7,0             | 3960     | 604      | 14,3            | 4960     | 2101     | 9,8             |
| 980      | 2298     | 1,8             | 1980     | 1477     | 14,8            | 2980     | 206      | 6,8             | 3980     | 633      | 14,5            | 4980     | 2120     | 9,8             |
| 1000     | 0°2301   | +1,0            | 2000     | 0°1447   | -14,8           | 3000     | 0°0193   | -6,5            | 4000     | 0°0662   | +14,8           | 5000     | 0°2140   | +10,0           |

Applied Constant:  $\pm 0^{\circ}.1200$ .

# SATELLITE III

## Approximate Tables of Conjunction

IV      Equation of Geocentric Conjunction      Argument  $\beta$       Oc, Tr

| $\beta$ | Equat n | $\Delta$ | $\beta$ | Equat n | $\Delta$ | $\beta$ | Equat on | $\Delta$ | $\beta$ | Equation | $\Delta$ |
|---------|---------|----------|---------|---------|----------|---------|----------|----------|---------|----------|----------|
| 0       | -0 4    | - 43     | 100     | - 2564  | + 6      | 200     | -0 0384  | + 29     | 300     | +0 1771  | + 6      |
| 2       | 486     | 43       | 102     | 551     | 7        | 202     | 3 6      | 29       | 302     | 178      | 5        |
| 4       | 571     | 4        | 104     | 536     | 8        | 204     | 68       | 29       | 304     | 1790     | 4        |
| 6       | 656     | 42       | 106     | 5 8     | 9        | 206     | 1        | 9        | 306     | 1797     | 3        |
| 8       | 740     | 42       | 108     | 2499    | 10       | 208     | 153      | 29       | 308     | 1801     |          |
| 10      | 8 4     | 4        | 110     | 479     | 11       | 210     | 95       | 29       | 310     | 1803     | + 1      |
| 12      | - 9 7   | - 4      | 112     | -0 2456 | + 1      | 212     | -0 0037  | + 29     | 312     | +0 1803  | - 1      |
| 14      | 99      | 41       | 114     | 43      | 13       | 214     | + 0      | 29       | 314     | 1801     |          |
| 16      | 1 71    | 40       | 116     | 406     | 14       | 216     | 77       | 28       | 316     | 1797     | 3        |
| 18      | 1151    | 40       | 118     | 2378    | 14       | 218     | 134      | 29       | 318     | 1791     | 4        |
| 20      | 1 30    | 39       | 120     | 349     | 15       | 220     | 191      | 28       | 320     | 1782     | 5        |
| 22      | 0 13 7  | - 38     | 122     | -0 2319 | + 16     | 222     | +0 0246  | + 28     | 322     | +0 1771  | - 6      |
| 24      | 383     | 38       | 124     | 87      | 17       | 224     | 30       | 8        | 324     | 1757     | 7        |
| 26      | 1458    | 37       | 126     | 253     | 17       | 226     | 358      | 28       | 326     | 1742     | 8        |
| 28      | 153     | 36       | 128     | 18      | 18       | 228     | 413      | 27       | 328     | 17 4     | 10       |
| 30      | 1600    | 35       | 130     | 182     | 19       | 230     | 467      | 27       | 330     | 1702     | 11       |
| 32      | -0 1668 | - 34     | 132     | - 2144  | + 19     | 232     | +0 0521  | + 27     | 332     | +0 1679  | - 1      |
| 34      | 1734    | 33       | 134     | 105     | 20       | 234     | 575      | 7        | 334     | 1653     | 14       |
| 36      | 1799    | 3        | 136     | 065     | 0        | 236     | 628      | 27       | 336     | 1625     | 15       |
| 38      | 1860    | 30       | 138     | 2025    | 1        | 238     | 681      | 26       | 338     | 1594     | 16       |
| 40      | 19 0    | 29       | 140     | 1982    | 22       | 240     | 733      | 26       | 340     | 1561     | 17       |
| 42      | -0 1977 | - 28     | 142     | -0 1938 | + 22     | 242     | +0 0784  | + 25     | 342     | +0 1525  | - 19     |
| 44      | 032     | 7        | 144     | 1894    | 3        | 244     | 834      | 5        | 344     | 1487     | 0        |
| 46      | 084     | 26       | 146     | 1848    | 3        | 246     | 883      | 25       | 346     | 1445     | 21       |
| 48      | 134     | 5        | 148     | 18 2    | 4        | 248     | 93       | 4        | 348     | 1401     | 2        |
| 50      | 18      | 23       | 150     | 1754    | 4        | 250     | 980      | 24       | 350     | 1356     | 24       |
| 52      | -0 26   | - 22     | 152     | -0 1706 | + 24     | 252     | +0 10 7  | + 3      | 352     | +0 1307  | - 25     |
| 54      | 269     | 1        | 154     | 1657    | 5        | 254     | 1073     | 23       | 354     | 1 56     | 26       |
| 56      | 2308    | 19       | 156     | 16 7    | 25       | 256     | 1118     | 23       | 356     | 1202     | 28       |
| 58      | 346     | 18       | 158     | 1556    | 26       | 258     | 1163     | 2        | 358     | 1145     | 9        |
| 60      | 380     | 17       | 160     | 1504    | 26       | 260     | 1206     | 1        | 360     | 1087     | 3        |
| 62      | -0 241  | - 15     | 162     | -0 1452 | + 6      | 262     | +0 1248  | + 21     | 362     | +0 1026  | - 31     |
| 64      | 441     | 14       | 164     | 1399    | 7        | 264     | 1288     | 20       | 364     | 963      | 32       |
| 66      | 2468    | 13       | 166     | 1346    | 27       | 266     | 1327     | 19       | 366     | 898      | 33       |
| 68      | 49      | 12       | 168     | 1 9     | 7        | 268     | 1365     | 19       | 368     | 831      | 34       |
| 70      | 514     | 11       | 170     | 1 37    | 8        | 270     | 140      | 18       | 370     | 761      | 35       |
| 72      | -0 534  | - 9      | 172     | -0 118  | + 28     | 272     | +0 1438  | + 18     | 372     | +0 0690  | - 36     |
| 74      | 551     | 8        | 174     | 11 7    | 8        | 274     | 147      | 17       | 374     | 616      | 37       |
| 76      | 565     | 7        | 176     | 1 71    | 8        | 276     | 1505     | 16       | 376     | 54       | 38       |
| 78      | 577     | 6        | 178     | 1015    | 8        | 278     | 1536     | 15       | 378     | 464      | 39       |
| 80      | 587     | 5        | 180     | 959     | 28       | 280     | 1566     | 15       | 380     | 386      | 40       |
| 82      | -0 2595 | - 3      | 182     | 0 902   | + 29     | 282     | + 1594   | + 14     | 382     | +0 0306  | - 40     |
| 84      | 6 0     |          | 184     | 845     | 9        | 284     | 16 1     | 13       | 384     | 226      | 41       |
| 86      | 603     | 1        | 186     | 788     | 29       | 286     | 1646     | 1        | 386     | 144      | 41       |
| 88      | 603     | 0        | 188     | 731     | 29       | 288     | 1669     | 11       | 388     | + 61     | 42       |
| 90      | 6 3     | + 1      | 190     | 673     | 29       | 290     | 169      | 10       | 390     | - 3      | 42       |
| 92      | -0 599  | + 3      | 192     | -0 0615 | + 29     | 292     | +0 171   | + 10     | 392     | -0 0107  | - 42     |
| 94      | 593     | 4        | 194     | 557     | 29       | 294     | 17 8     | 9        | 394     | 192      | 43       |
| 96      | 2585    | 5        | 196     | 500     | 9        | 296     | 1744     | 8        | 396     | 277      | 43       |
| 98      | 575     | 5        | 198     | 44      | 29       | 298     | 1759     | 7        | 398     | 363      | 43       |
| 100     | -0 2564 | + 6      | 200     | -0 0384 | + 29     | 300     | +0 1771  | + 6      | 400     | -0 0448  | - 43     |

Appl d C t t Th Eq ti f f bl IV t d by th f T bl V VI ga th An LP ll p whi h m t b ppl d f O lt ti  
dT t t th ti fth Cl m 8 f T bl I d whi h l rv g m t f T bl LXVI mp ti gth f t f J pit ph

# SATELLITE III

## Approximate Tables of Conjunction

| V                         | Equation of Geocentric Conjunction |        |        |        |        |        |        |        |        | Arguments $\alpha, \beta$ |         |         |         |         |         | Oc., Tr. |         |         |         |         |         |
|---------------------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------------------------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|
| $\alpha \backslash \beta$ | $0^d$                              | $10^d$ | $20^d$ | $30^d$ | $40^d$ | $50^d$ | $60^d$ | $70^d$ | $80^d$ | $90^d$                    | $100^d$ | $110^d$ | $120^d$ | $130^d$ | $140^d$ | $150^d$  | $160^d$ | $170^d$ | $180^d$ | $190^d$ | $200^d$ |
| $0$                       | 300                                | 275    | 252    | 231    | 213    | 199    | 188    | 183    | 182    | 185                       | 191     | 199     | 210     | 222     | 235     | 247      | 259     | 270     | 281     | 291     | 301     |
| 100                       | 336                                | 311    | 286    | 262    | 240    | 221    | 206    | 194    | 187    | 185                       | 186     | 190     | 197     | 206     | 216     | 226      | 237     | 247     | 257     | 266     | 276     |
| 200                       | 372                                | 347    | 320    | 294    | 268    | 245    | 225    | 208    | 196    | 188                       | 183     | 183     | 186     | 191     | 198     | 206      | 216     | 224     | 233     | 242     | 252     |
| 300                       | 406                                | 380    | 354    | 326    | 298    | 270    | 245    | 224    | 206    | 193                       | 184     | 178     | 177     | 179     | 183     | 189      | 196     | 203     | 211     | 220     | 228     |
| 400                       | 437                                | 415    | 387    | 358    | 327    | 297    | 267    | 241    | 219    | 200                       | 186     | 176     | 171     | 169     | 170     | 174      | 179     | 184     | 191     | 199     | 207     |
| 500                       | 466                                | 445    | 418    | 388    | 356    | 323    | 290    | 260    | 233    | 210                       | 191     | 177     | 168     | 162     | 160     | 161      | 164     | 168     | 174     | 180     | 187     |
| 600                       | 492                                | 473    | 447    | 417    | 384    | 348    | 313    | 279    | 248    | 221                       | 198     | 180     | 167     | 158     | 153     | 151      | 152     | 155     | 159     | 163     | 169     |
| 700                       | 513                                | 496    | 472    | 443    | 409    | 373    | 335    | 299    | 265    | 234                       | 208     | 186     | 169     | 157     | 149     | 145      | 143     | 144     | 146     | 150     | 155     |
| 800                       | 530                                | 516    | 494    | 466    | 433    | 396    | 357    | 319    | 282    | 249                       | 219     | 194     | 174     | 159     | 148     | 141      | 138     | 137     | 137     | 140     | 143     |
| 900                       | 542                                | 531    | 512    | 486    | 453    | 417    | 378    | 338    | 300    | 264                       | 232     | 204     | 181     | 164     | 151     | 141      | 136     | 133     | 132     | 133     | 135     |
| 1000                      | 549                                | 542    | 525    | 501    | 471    | 436    | 397    | 357    | 318    | 280                       | 246     | 216     | 191     | 171     | 156     | 145      | 137     | 133     | 130     | 129     | 130     |
| 1100                      | 551                                | 547    | 534    | 513    | 485    | 451    | 414    | 374    | 335    | 297                       | 262     | 230     | 204     | 182     | 165     | 151      | 142     | 136     | 132     | 130     | 129     |
| 1200                      | 547                                | 547    | 538    | 520    | 495    | 464    | 428    | 390    | 352    | 314                       | 278     | 246     | 218     | 195     | 176     | 161      | 150     | 142     | 137     | 133     | 131     |
| 1300                      | 539                                | 542    | 536    | 522    | 501    | 473    | 440    | 404    | 367    | 330                       | 295     | 263     | 234     | 210     | 190     | 174      | 161     | 152     | 146     | 140     | 137     |
| 1400                      | 525                                | 531    | 530    | 520    | 502    | 478    | 449    | 416    | 381    | 346                       | 312     | 280     | 251     | 227     | 206     | 189      | 175     | 165     | 157     | 151     | 146     |
| 1500                      | 507                                | 517    | 519    | 513    | 500    | 480    | 455    | 425    | 394    | 361                       | 329     | 298     | 270     | 245     | 224     | 207      | 192     | 182     | 172     | 165     | 159     |
| 1600                      | 484                                | 497    | 504    | 502    | 493    | 478    | 457    | 432    | 404    | 374                       | 345     | 316     | 289     | 265     | 244     | 226      | 210     | 199     | 189     | 181     | 174     |
| 1700                      | 457                                | 473    | 483    | 486    | 482    | 472    | 454    | 436    | 412    | 386                       | 360     | 333     | 308     | 286     | 265     | 248      | 232     | 220     | 210     | 200     | 192     |
| 1800                      | 427                                | 446    | 460    | 466    | 468    | 463    | 452    | 437    | 418    | 397                       | 374     | 350     | 328     | 306     | 287     | 270      | 254     | 242     | 231     | 222     | 213     |
| 1900                      | 394                                | 415    | 432    | 444    | 450    | 450    | 445    | 435    | 422    | 405                       | 386     | 366     | 346     | 327     | 309     | 293      | 278     | 266     | 255     | 244     | 235     |
| 2000                      | 360                                | 383    | 402    | 418    | 428    | 434    | 435    | 431    | 422    | 411                       | 396     | 380     | 364     | 347     | 331     | 316      | 301     | 290     | 278     | 268     | 258     |
| 2100                      | 324                                | 348    | 370    | 389    | 404    | 415    | 422    | 423    | 421    | 414                       | 405     | 393     | 380     | 366     | 352     | 338      | 325     | 314     | 303     | 293     | 283     |
| 2200                      | 288                                | 312    | 337    | 359    | 378    | 394    | 406    | 413    | 417    | 415                       | 411     | 404     | 394     | 384     | 372     | 360      | 348     | 338     | 328     | 318     | 308     |
| 2300                      | 252                                | 276    | 302    | 327    | 350    | 371    | 388    | 401    | 410    | 414                       | 415     | 413     | 407     | 400     | 391     | 381      | 371     | 361     | 351     | 342     | 333     |
| 2400                      | 217                                | 241    | 268    | 295    | 322    | 346    | 368    | 387    | 401    | 411                       | 417     | 419     | 417     | 413     | 407     | 400      | 391     | 383     | 374     | 365     | 356     |
| 2500                      | 183                                | 207    | 234    | 263    | 292    | 321    | 347    | 370    | 390    | 405                       | 416     | 422     | 425     | 425     | 422     | 417      | 410     | 403     | 396     | 388     | 379     |
| 2600                      | 152                                | 175    | 202    | 232    | 263    | 295    | 325    | 353    | 377    | 397                       | 413     | 424     | 430     | 434     | 433     | 431      | 426     | 421     | 415     | 408     | 400     |
| 2700                      | 125                                | 146    | 172    | 202    | 235    | 269    | 302    | 334    | 362    | 387                       | 407     | 422     | 433     | 440     | 442     | 442      | 440     | 436     | 431     | 426     | 419     |
| 2800                      | 100                                | 119    | 144    | 174    | 208    | 243    | 279    | 314    | 346    | 375                       | 399     | 418     | 433     | 443     | 449     | 451      | 451     | 449     | 446     | 441     | 436     |
| 2900                      | 80                                 | 96     | 120    | 148    | 182    | 219    | 257    | 294    | 329    | 361                       | 389     | 412     | 429     | 443     | 452     | 457      | 459     | 459     | 457     | 454     | 450     |
| 3000                      | 65                                 | 78     | 99     | 127    | 160    | 197    | 236    | 274    | 312    | 346                       | 377     | 403     | 424     | 440     | 451     | 459      | 463     | 465     | 465     | 463     | 460     |
| 3100                      | 55                                 | 64     | 83     | 109    | 140    | 176    | 216    | 255    | 294    | 330                       | 363     | 392     | 416     | 434     | 448     | 458      | 465     | 467     | 469     | 469     | 467     |
| 3200                      | 50                                 | 56     | 71     | 94     | 124    | 159    | 197    | 237    | 276    | 314                       | 349     | 379     | 405     | 425     | 441     | 453      | 462     | 467     | 469     | 471     | 471     |
| 3300                      | 50                                 | 53     | 64     | 85     | 112    | 144    | 181    | 220    | 259    | 297                       | 333     | 365     | 392     | 414     | 432     | 446      | 456     | 462     | 467     | 469     | 471     |
| 3400                      | 55                                 | 54     | 62     | 79     | 103    | 133    | 168    | 205    | 243    | 281                       | 316     | 349     | 377     | 411     | 420     | 435      | 447     | 455     | 461     | 465     | 467     |
| 3500                      | 65                                 | 61     | 65     | 78     | 98     | 125    | 157    | 191    | 228    | 264                       | 299     | 332     | 360     | 385     | 405     | 421      | 435     | 444     | 451     | 456     | 461     |
| 3600                      | 81                                 | 73     | 73     | 82     | 98     | 121    | 149    | 180    | 214    | 249                       | 282     | 314     | 342     | 367     | 388     | 405      | 420     | 430     | 438     | 445     | 450     |
| 3700                      | 100                                | 90     | 86     | 90     | 102    | 120    | 144    | 172    | 203    | 235                       | 266     | 296     | 324     | 348     | 369     | 387      | 402     | 413     | 422     | 430     | 436     |
| 3800                      | 125                                | 111    | 103    | 103    | 110    | 124    | 143    | 166    | 193    | 221                       | 250     | 278     | 305     | 328     | 349     | 367      | 382     | 394     | 404     | 413     | 420     |
| 3900                      | 153                                | 136    | 125    | 120    | 122    | 131    | 145    | 163    | 185    | 210                       | 235     | 261     | 285     | 307     | 327     | 345      | 361     | 372     | 383     | 393     | 401     |
| 4000                      | 184                                | 164    | 150    | 141    | 138    | 141    | 150    | 163    | 180    | 200                       | 222     | 244     | 266     | 287     | 306     | 322      | 338     | 350     | 361     | 371     | 380     |
| 4100                      | 217                                | 195    | 178    | 165    | 157    | 155    | 158    | 166    | 178    | 193                       | 210     | 229     | 248     | 266     | 284     | 300      | 314     | 326     | 337     | 348     | 357     |
| 4200                      | 252                                | 229    | 208    | 192    | 179    | 172    | 169    | 171    | 178    | 188                       | 200     | 215     | 231     | 246     | 262     | 277      | 291     | 302     | 313     | 324     | 333     |
| 4300                      | 288                                | 264    | 241    | 221    | 204    | 192    | 183    | 180    | 180    | 185                       | 193     | 203     | 215     | 228     | 241     | 254      | 267     | 278     | 289     | 299     | 309     |
| 4400                      | 325                                | 300    | 275    | 252    | 231    | 214    | 200    | 190    | 185    | 185                       | 187     | 193     | 201     | 211     | 222     | 232      | 244     | 254     | 264     | 274     | 284     |
| 4500                      | 360                                | 335    | 309    | 283    | 259    | 237    | 218    | 203    | 193    | 187                       | 184     | 185     | 189     | 195     | 204     | 213      | 222     | 231     | 241     | 250     | 260     |

The unit in this Table equals  $0^d.0000$ .

Applied Constant:  $+0^d.0300$ .

The entries are all positive.

The Equation of this Table to be added to that of Table IV.

# SATELLITE III

## Approximate Tables of Conjunction

*V continued*

Equation of Geocentric Conjunction

Arguments  $\alpha \beta$

Oc, Tr

| $\beta$<br>$\alpha$ | 200 <sup>d</sup> | 210 <sup>d</sup> | 220 <sup>d</sup> | 230 <sup>d</sup> | 240 <sup>d</sup> | 250 <sup>d</sup> | 260 <sup>d</sup> | 270 <sup>d</sup> | 280 <sup>d</sup> | 290 <sup>d</sup> | 300 <sup>d</sup> | 310 <sup>d</sup> | 320 <sup>d</sup> | 330 <sup>d</sup> | 340 <sup>d</sup> | 350 <sup>d</sup> | 360 <sup>d</sup> | 370 <sup>d</sup> | 380 <sup>d</sup> | 390 <sup>d</sup> | 400 <sup>d</sup> |
|---------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| $\alpha$            |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |
| 0                   | 301              | 310              | 30               | 331              | 34               | 354              | 367              | 379              | 391              | 402              | 410              | 416              | 418              | 417              | 411              | 400              | 385              | 367              | 345              | 32               | 297              |
| 100                 | 276              | 86               | 96               | 307              | 319              | 333              | 347              | 362              | 376              | 391              | 404              | 415              | 422              | 426              | 46               | 41               | 412              | 397              | 379              | 357              | 333              |
| 200                 | 5                | 61               | 271              | 283              | 95               | 310              | 326              | 34               | 360              | 378              | 395              | 411              | 44               | 433              | 439              | 440              | 435              | 425              | 411              | 391              | 369              |
| 300                 | 8                | 238              | 48               | 259              | 7                | 87               | 34               | 32               | 342              | 363              | 384              | 405              | 43               | 438              | 449              | 455              | 456              | 451              | 440              | 44               | 403              |
| 400                 | 207              | 15               | 224              | 36               | 249              | 264              | 8                | 302              | 324              | 348              | 37               | 396              | 419              | 439              | 456              | 467              | 473              | 473              | 467              | 454              | 435              |
| 500                 | 187              | 195              | 04               | 14               | 7                | 24               | 61               | 281              | 305              | 331              | 358              | 386              | 413              | 438              | 460              | 476              | 487              | 492              | 490              | 480              | 464              |
| 600                 | 169              | 176              | 184              | 194              | 206              | 1                | 40               | 61               | 85               | 313              | 343              | 374              | 44               | 433              | 460              | 480              | 497              | 507              | 509              | 503              | 490              |
| 700                 | 155              | 160              | 168              | 177              | 88               | 0                | 0                | 242              | 67               | 295              | 327              | 360              | 393              | 426              | 456              | 483              | 53               | 517              | 523              | 521              | 512              |
| 800                 | 143              | 148              | 154              | 162              | 172              | 185              | 203              | 24               | 249              | 278              | 310              | 345              | 381              | 416              | 450              | 480              | 505              | 523              | 533              | 535              | 529              |
| 900                 | 135              | 138              | 143              | 150              | 159              | 171              | 187              | 07               | 232              | 60               | 93               | 329              | 366              | 404              | 440              | 474              | 502              | 524              | 539              | 544              | 542              |
| 1000                | 13               | 13               | 135              | 141              | 148              | 159              | 174              | 193              | 16               | 244              | 76               | 312              | 350              | 389              | 428              | 464              | 495              | 50               | 539              | 548              | 549              |
| 1100                | 129              | 19               | 131              | 135              | 141              | 150              | 163              | 180              | 2                | 229              | 61               | 96               | 334              | 373              | 413              | 450              | 484              | 512              | 534              | 547              | 551              |
| 1200                | 131              | 13               | 131              | 133              | 137              | 144              | 156              | 171              | 190              | 15               | 245              | 279              | 316              | 355              | 395              | 434              | 469              | 500              | 54               | 540              | 548              |
| 1300                | 137              | 135              | 133              | 134              | 137              | 14               | 151              | 164              | 181              | 03               | 31               | 63               | 298              | 336              | 376              | 414              | 451              | 483              | 509              | 528              | 539              |
| 1400                | 146              | 143              | 140              | 139              | 140              | 143              | 149              | 159              | 174              | 193              | 18               | 247              | 8                | 316              | 355              | 392              | 49               | 462              | 490              | 512              | 526              |
| 1500                | 159              | 154              | 150              | 147              | 146              | 147              | 151              | 158              | 170              | 186              | 207              | 33               | 263              | 296              | 33               | 369              | 405              | 438              | 467              | 491              | 508              |
| 1600                | 174              | 168              | 163              | 158              | 155              | 154              | 155              | 160              | 168              | 180              | 198              | 20               | 46               | 76               | 309              | 344              | 378              | 411              | 441              | 466              | 486              |
| 1700                | 192              | 185              | 179              | 173              | 168              | 165              | 163              | 165              | 169              | 178              | 191              | 209              | 230              | 256              | 86               | 317              | 350              | 381              | 411              | 438              | 459              |
| 1800                | 213              | 5                | 197              | 190              | 183              | 178              | 174              | 17               | 173              | 177              | 186              | 200              | 216              | 238              | 263              | 291              | 321              | 350              | 380              | 406              | 429              |
| 1900                | 235              | 226              | 18               | 09               | 201              | 194              | 187              | 182              | 180              | 180              | 184              | 192              | 204              | 20               | 241              | 265              | 291              | 318              | 346              | 373              | 397              |
| 2000                | 258              | 49               | 240              | 31               | 221              | 21               | 203              | 195              | 189              | 185              | 184              | 187              | 194              | 205              | 0                | 39               | 261              | 286              | 312              | 338              | 363              |
| 2100                | 283              | 73               | 64               | 53               | 243              | 231              | 221              | 10               | 00               | 192              | 187              | 184              | 186              | 191              | 201              | 15               | 233              | 54               | 77               | 302              | 327              |
| 2200                | 38               | 298              | 288              | 77               | 65               | 53               | 40               | 6                | 14               | 202              | 19               | 184              | 180              | 180              | 184              | 192              | 205              | 22               | 243              | 266              | 29               |
| 2300                | 333              | 33               | 313              | 301              | 289              | 75               | 60               | 45               | 29               | 14               | 199              | 187              | 177              | 171              | 169              | 172              | 180              | 193              | 210              | 31               | 54               |
| 2400                | 356              | 347              | 337              | 35               | 31               | 98               | 282              | 264              | 46               | 227              | 8                | 191              | 176              | 165              | 157              | 155              | 158              | 166              | 179              | 197              | 219              |
| 2500                | 379              | 370              | 360              | 349              | 336              | 31               | 304              | 285              | 264              | 24               | 220              | 198              | 178              | 161              | 148              | 140              | 138              | 141              | 151              | 166              | 186              |
| 2600                | 40               | 392              | 38               | 372              | 359              | 343              | 325              | 305              | 282              | 258              | 33               | 207              | 183              | 161              | 143              | 129              | 121              | 120              | 125              | 137              | 155              |
| 2700                | 419              | 412              | 404              | 39               | 380              | 365              | 346              | 36               | 32               | 75               | 247              | 218              | 190              | 163              | 140              | 12               | 109              | 103              | 104              | 112              | 127              |
| 2800                | 436              | 49               | 42               | 412              | 399              | 385              | 367              | 346              | 31               | 293              | 63               | 31               | 199              | 169              | 141              | 118              | 100              | 89               | 86               | 9                | 102              |
| 2900                | 450              | 444              | 438              | 49               | 418              | 404              | 385              | 365              | 339              | 311              | 79               | 245              | 211              | 177              | 145              | 118              | 96               | 80               | 7                | 73               | 82               |
| 3000                | 460              | 456              | 45               | 443              | 433              | 40               | 403              | 38               | 357              | 329              | 96               | 261              | 24               | 188              | 153              | 122              | 96               | 78               | 65               | 61               | 66               |
| 3100                | 467              | 465              | 46               | 456              | 445              | 433              | 418              | 398              | 374              | 345              | 31               | 77               | 239              | 201              | 163              | 19               | 100              | 77               | 61               | 54               | 55               |
| 3200                | 471              | 469              | 466              | 46               | 455              | 444              | 430              | 41               | 389              | 361              | 329              | 93               | 255              | 216              | 177              | 14               | 108              | 8                | 63               | 5                | 50               |
| 3300                | 471              | 471              | 469              | 466              | 461              | 45               | 440              | 43               | 402              | 376              | 345              | 310              | 7                | 33               | 193              | 155              | 121              | 91               | 69               | 55               | 50               |
| 3400                | 467              | 468              | 469              | 467              | 463              | 457              | 447              | 432              | 413              | 389              | 360              | 37               | 290              | 251              | 11               | 173              | 137              | 106              | 81               | 64               | 54               |
| 3500                | 461              | 463              | 465              | 465              | 463              | 458              | 450              | 438              | 42               | 400              | 374              | 343              | 38               | 270              | 231              | 193              | 156              | 14               | 97               | 77               | 64               |
| 3600                | 450              | 454              | 457              | 459              | 459              | 456              | 451              | 441              | 428              | 410              | 386              | 358              | 36               | 290              | 253              | 215              | 179              | 146              | 117              | 94               | 80               |
| 3700                | 436              | 442              | 446              | 449              | 451              | 451              | 448              | 442              | 431              | 416              | 396              | 372              | 343              | 311              | 275              | 239              | 204              | 171              | 141              | 117              | 99               |
| 3800                | 42               | 46               | 432              | 437              | 441              | 443              | 44               | 439              | 43               | 421              | 405              | 384              | 359              | 331              | 298              | 265              | 231              | 199              | 169              | 143              | 123              |
| 3900                | 401              | 408              | 415              | 41               | 47               | 431              | 433              | 433              | 43               | 43               | 411              | 395              | 375              | 350              | 32               | 29               | 260              | 9                | 199              | 173              | 151              |
| 4000                | 380              | 388              | 396              | 404              | 411              | 417              | 42               | 45               | 425              | 422              | 415              | 404              | 388              | 368              | 344              | 318              | 89               | 26               | 231              | 05               | 181              |
| 4100                | 357              | 366              | 375              | 384              | 39               | 41               | 48               | 414              | 418              | 419              | 416              | 410              | 400              | 385              | 366              | 344              | 319              | 29               | 265              | 239              | 15               |
| 4200                | 333              | 343              | 35               | 36               | 372              | 38               | 392              | 400              | 408              | 413              | 415              | 414              | 409              | 400              | 386              | 369              | 348              | 325              | 30               | 274              | 249              |
| 4300                | 309              | 318              | 38               | 339              | 350              | 361              | 373              | 385              | 396              | 405              | 412              | 416              | 416              | 413              | 45               | 393              | 377              | 357              | 334              | 310              | 86               |
| 4400                | 284              | 94               | 304              | 315              | 327              | 34               | 353              | 367              | 381              | 394              | 406              | 415              | 421              | 43               | 41               | 415              | 403              | 388              | 368              | 346              | 322              |
| 4500                | 260              | 69               | 279              | 91               | 303              | 317              | 333              | 349              | 366              | 38               | 398              | 412              | 424              | 431              | 435              | 434              | 428              | 417              | 40               | 380              | 358              |

TI it i th T bl q l oo

Th Eq tl fthi T bl t b dd dt th t f T bl IV

Th t l ll p th

# SATELLITE III

## Approximate Tables of Conjunction

VI      Equation of Geocentric Conjunction      Arguments  $\beta, \gamma$       Oc., Tr.

| $\beta$<br>$\gamma$ | 0 <sup>d</sup> | 20 <sup>d</sup> | 40 <sup>d</sup> | 60 <sup>d</sup> | 80 <sup>d</sup> | 100 <sup>d</sup> | 120 <sup>d</sup> | 140 <sup>d</sup> | 160 <sup>d</sup> | 180 <sup>d</sup> | 200 <sup>d</sup> | 220 <sup>d</sup> | 240 <sup>d</sup> | 260 <sup>d</sup> | 280 <sup>d</sup> | 300 <sup>d</sup> | 320 <sup>d</sup> | 340 <sup>d</sup> | 360 <sup>d</sup> | 380 <sup>d</sup> | 400 <sup>d</sup> |
|---------------------|----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0                   | 100            | 117             | 130             | 138             | 141             | 138              | 131              | 123              | 115              | 107              | 100              | 93               | 85               | 77               | 69               | 62               | 59               | 62               | 71               | 85               | 101              |
| 20                  | 70             | 87              | 106             | 123             | 134             | 140              | 141              | 138              | 133              | 127              | 120              | 113              | 105              | 94               | 82               | 69               | 57               | 50               | 50               | 57               | 71               |
| 40                  | 43             | 60              | 81              | 104             | 124             | 138              | 146              | 149              | 147              | 144              | 139              | 133              | 124              | 113              | 97               | 79               | 60               | 44               | 35               | 35               | 44               |
| 60                  | 23             | 37              | 59              | 85              | 111             | 132              | 146              | 154              | 156              | 156              | 153              | 148              | 141              | 129              | 113              | 92               | 68               | 45               | 28               | 20               | 24               |
| 80                  | 12             | 22              | 41              | 68              | 96              | 121              | 140              | 152              | 159              | 161              | 160              | 158              | 153              | 143              | 127              | 105              | 79               | 52               | 29               | 15               | 12               |
| 100                 | 11             | 15              | 31              | 55              | 82              | 109              | 130              | 145              | 154              | 159              | 161              | 161              | 158              | 151              | 138              | 119              | 93               | 65               | 39               | 20               | 11               |
| 120                 | 21             | 19              | 28              | 47              | 70              | 95               | 116              | 132              | 143              | 150              | 154              | 157              | 157              | 154              | 145              | 129              | 108              | 81               | 55               | 34               | 21               |
| 140                 | 40             | 32              | 34              | 45              | 62              | 82               | 100              | 116              | 127              | 136              | 141              | 146              | 149              | 150              | 146              | 137              | 121              | 100              | 77               | 55               | 40               |
| 160                 | 66             | 53              | 47              | 49              | 58              | 71               | 84               | 97               | 108              | 117              | 123              | 130              | 135              | 140              | 142              | 140              | 133              | 119              | 102              | 82               | 65               |
| 180                 | 96             | 80              | 67              | 60              | 59              | 63               | 71               | 79               | 88               | 96               | 103              | 110              | 118              | 125              | 133              | 139              | 140              | 136              | 126              | 112              | 95               |
| 200                 | 126            | 109             | 91              | 75              | 64              | 60               | 60               | 64               | 69               | 76               | 82               | 89               | 98               | 108              | 120              | 133              | 143              | 148              | 148              | 139              | 125              |
| 220                 | 154            | 137             | 115             | 93              | 74              | 61               | 54               | 52               | 54               | 58               | 63               | 70               | 78               | 90               | 105              | 123              | 141              | 155              | 163              | 162              | 153              |
| 240                 | 175            | 160             | 138             | 112             | 87              | 67               | 54               | 47               | 44               | 45               | 49               | 53               | 61               | 73               | 89               | 110              | 134              | 155              | 172              | 178              | 174              |
| 260                 | 187            | 177             | 157             | 129             | 102             | 77               | 59               | 47               | 41               | 39               | 40               | 43               | 48               | 59               | 75               | 96               | 123              | 149              | 172              | 185              | 187              |
| 280                 | 189            | 185             | 168             | 144             | 116             | 90               | 69               | 54               | 45               | 40               | 39               | 39               | 42               | 49               | 63               | 83               | 109              | 137              | 163              | 182              | 189              |
| 300                 | 181            | 182             | 172             | 152             | 128             | 103              | 82               | 66               | 55               | 48               | 44               | 42               | 42               | 46               | 56               | 72               | 94               | 121              | 147              | 169              | 181              |
| 320                 | 163            | 170             | 167             | 155             | 137             | 117              | 98               | 82               | 70               | 62               | 56               | 52               | 50               | 49               | 54               | 64               | 79               | 102              | 126              | 148              | 163              |
| 340                 | 138            | 150             | 155             | 151             | 142             | 128              | 113              | 100              | 89               | 80               | 74               | 68               | 63               | 59               | 57               | 60               | 69               | 83               | 102              | 121              | 138              |
| 360                 | 108            | 124             | 136             | 142             | 142             | 136              | 128              | 119              | 109              | 101              | 94               | 87               | 80               | 72               | 66               | 61               | 61               | 66               | 77               | 92               | 109              |
| 380                 | 78             | 95              | 113             | 127             | 136             | 140              | 139              | 134              | 128              | 122              | 115              | 108              | 100              | 90               | 78               | 66               | 57               | 53               | 55               | 64               | 78               |
| 400                 | 50             | 67              | 88              | 109             | 127             | 139              | 145              | 146              | 144              | 140              | 134              | 128              | 120              | 108              | 93               | 76               | 59               | 45               | 38               | 40               | 50               |

The unit in this Table is  $0^h 00^m 00^s$ .

Applied Constant:  $+0^h 01^m 00^s$ .

The sign is positive.

The Equation of this Table to be added to that of Table IV.

# SATELLITE III

## Approximate Tables of Conjunction

### Equations of Conjunction

VII

| $\delta$   | Equation  |
|------------|-----------|
| <b>00</b>  | d<br>0 00 |
| <b>2</b>   | 22        |
| <b>4</b>   | 5         |
| <b>6</b>   | 7         |
| <b>8</b>   | 9         |
| <b>10</b>  | 31        |
| <b>12</b>  | 0 003     |
| <b>4</b>   | 33        |
| <b>6</b>   | 34        |
| <b>8</b>   | 34        |
| <b>20</b>  | 34        |
| <b>22</b>  | 0 0033    |
| <b>4</b>   | 3         |
| <b>6</b>   | 31        |
| <b>8</b>   | 29        |
| <b>30</b>  | 7         |
| <b>32</b>  | 0 0025    |
| <b>4</b>   | 22        |
| <b>6</b>   | 0         |
| <b>8</b>   | 18        |
| <b>40</b>  | 15        |
| <b>42</b>  | 0 0013    |
| <b>4</b>   | 11        |
| <b>6</b>   | 9         |
| <b>8</b>   | 8         |
| <b>50</b>  | 7         |
| <b>52</b>  | 0 0006    |
| <b>4</b>   | 6         |
| <b>6</b>   | 6         |
| <b>8</b>   | 7         |
| <b>60</b>  | 8         |
| <b>62</b>  | 0 0009    |
| <b>4</b>   | 11        |
| <b>6</b>   | 13        |
| <b>8</b>   | 15        |
| <b>70</b>  | 18        |
| <b>72</b>  | 0 0020    |
| <b>4</b>   | 3         |
| <b>6</b>   | 25        |
| <b>8</b>   | 27        |
| <b>80</b>  | 29        |
| <b>82</b>  | 0 0031    |
| <b>4</b>   | 3         |
| <b>6</b>   | 33        |
| <b>8</b>   | 34        |
| <b>90</b>  | 34        |
| <b>92</b>  | 0 0034    |
| <b>4</b>   | 33        |
| <b>6</b>   | 32        |
| <b>8</b>   | 31        |
| <b>100</b> | 0 00 9    |

C t t + ∞

VIII

| $\epsilon$ | Equation  |
|------------|-----------|
| <b>00</b>  | d<br>0040 |
| <b>2</b>   | 34        |
| <b>4</b>   | 8         |
| <b>6</b>   | 3         |
| <b>8</b>   | 18        |
| <b>10</b>  | 14        |
| <b>12</b>  | 0 0011    |
| <b>4</b>   | 8         |
| <b>6</b>   | 7         |
| <b>8</b>   | 6         |
| <b>20</b>  | 7         |
| <b>22</b>  | 0 008     |
| <b>4</b>   | 11        |
| <b>6</b>   | 14        |
| <b>8</b>   | 19        |
| <b>30</b>  | 24        |
| <b>32</b>  | 0 00029   |
| <b>4</b>   | 35        |
| <b>6</b>   | 41        |
| <b>8</b>   | 47        |
| <b>40</b>  | 52        |
| <b>42</b>  | 0 0057    |
| <b>4</b>   | 6         |
| <b>6</b>   | 67        |
| <b>8</b>   | 70        |
| <b>50</b>  | 7         |
| <b>52</b>  | 0 0074    |
| <b>4</b>   | 74        |
| <b>6</b>   | 73        |
| <b>8</b>   | 71        |
| <b>60</b>  | 69        |
| <b>62</b>  | 0 0065    |
| <b>4</b>   | 61        |
| <b>6</b>   | 56        |
| <b>8</b>   | 51        |
| <b>70</b>  | 45        |
| <b>72</b>  | 0 0039    |
| <b>4</b>   | 33        |
| <b>6</b>   | 27        |
| <b>8</b>   | 2         |
| <b>80</b>  | 17        |
| <b>82</b>  | 0 0013    |
| <b>4</b>   | 10        |
| <b>6</b>   | 8         |
| <b>8</b>   | 6         |
| <b>90</b>  | 6         |
| <b>92</b>  | 0 0007    |
| <b>4</b>   | 9         |
| <b>6</b>   | 12        |
| <b>8</b>   | 15        |
| <b>100</b> | 0 002     |

C t t + ∞4

IX

| $\zeta$    | Equation |
|------------|----------|
| <b>00</b>  | 0 002    |
| <b>2</b>   | 18       |
| <b>4</b>   | 15       |
| <b>6</b>   | 13       |
| <b>8</b>   | 11       |
| <b>10</b>  | 9        |
| <b>12</b>  | 0 0008   |
| <b>4</b>   | 7        |
| <b>6</b>   | 6        |
| <b>8</b>   | 6        |
| <b>20</b>  | 6        |
| <b>22</b>  | 0 0007   |
| <b>4</b>   | 8        |
| <b>6</b>   | 9        |
| <b>8</b>   | 11       |
| <b>30</b>  | 13       |
| <b>32</b>  | 0 0015   |
| <b>4</b>   | 18       |
| <b>6</b>   | 20       |
| <b>8</b>   | 23       |
| <b>40</b>  | 25       |
| <b>42</b>  | 0 00 7   |
| <b>4</b>   | 9        |
| <b>6</b>   | 31       |
| <b>8</b>   | 32       |
| <b>50</b>  | 33       |
| <b>52</b>  | 0 0034   |
| <b>4</b>   | 34       |
| <b>6</b>   | 34       |
| <b>8</b>   | 33       |
| <b>60</b>  | 32       |
| <b>62</b>  | 0 0030   |
| <b>4</b>   | 29       |
| <b>6</b>   | 7        |
| <b>8</b>   | 4        |
| <b>70</b>  | 2        |
| <b>72</b>  | 0 0019   |
| <b>4</b>   | 17       |
| <b>6</b>   | 15       |
| <b>8</b>   | 13       |
| <b>80</b>  | 11       |
| <b>82</b>  | 0 0009   |
| <b>4</b>   | 8        |
| <b>6</b>   | 7        |
| <b>8</b>   | 6        |
| <b>90</b>  | 6        |
| <b>92</b>  | 0 006    |
| <b>4</b>   | 7        |
| <b>6</b>   | 8        |
| <b>8</b>   | 10       |
| <b>100</b> | 0 0012   |

C t t + ∞

X

| $\eta$     | Equation    |
|------------|-------------|
| <b>00</b>  | d<br>0 00 0 |
| <b>2</b>   | 23          |
| <b>4</b>   | 5           |
| <b>6</b>   | 7           |
| <b>8</b>   | 28          |
| <b>10</b>  | 8           |
| <b>12</b>  | 0 00 7      |
| <b>4</b>   | 25          |
| <b>6</b>   | 3           |
| <b>8</b>   | 20          |
| <b>20</b>  | 17          |
| <b>22</b>  | 0 0015      |
| <b>4</b>   | 13          |
| <b>6</b>   | 1           |
| <b>8</b>   | 12          |
| <b>30</b>  | 13          |
| <b>32</b>  | 0 0015      |
| <b>4</b>   | 18          |
| <b>6</b>   | 20          |
| <b>8</b>   | 23          |
| <b>40</b>  | 25          |
| <b>42</b>  | 0 0027      |
| <b>4</b>   | 28          |
| <b>6</b>   | 28          |
| <b>8</b>   | 27          |
| <b>50</b>  | 25          |
| <b>52</b>  | 0 0022      |
| <b>4</b>   | 20          |
| <b>6</b>   | 17          |
| <b>8</b>   | 15          |
| <b>60</b>  | 13          |
| <b>62</b>  | 0 0012      |
| <b>4</b>   | 1           |
| <b>6</b>   | 13          |
| <b>8</b>   | 15          |
| <b>70</b>  | 18          |
| <b>72</b>  | 0 0021      |
| <b>4</b>   | 23          |
| <b>6</b>   | 25          |
| <b>8</b>   | 27          |
| <b>80</b>  | 28          |
| <b>82</b>  | 0 0028      |
| <b>4</b>   | 27          |
| <b>6</b>   | 25          |
| <b>8</b>   | 22          |
| <b>90</b>  | 19          |
| <b>92</b>  | 0 0016      |
| <b>4</b>   | 14          |
| <b>6</b>   | 13          |
| <b>8</b>   | 12          |
| <b>100</b> | 0 0012      |

C ta t + ∞



# SATELLITE III

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## Tables

of

Longitude on Jupiter's Orbit,  
Variation of the Radius Vector,  
and Latitude



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### XI Values at Epoch of Mean Longitude and the Arguments

| 1       | 2          | 3            | 4          | 5         | 6           | 7           | 8         | 9         | 10        | 11         | 12       | 13          |
|---------|------------|--------------|------------|-----------|-------------|-------------|-----------|-----------|-----------|------------|----------|-------------|
| Date    | Mean Long. | A            | B          | C         | D           | E           | F         | G         | H         | I          | J        | K           |
| 1850°0  | 346°69972  | d<br>5°61104 | d<br>7°110 | d<br>5°78 | d<br>2°6522 | d<br>1°9589 | d<br>1°54 | d<br>2°21 | d<br>4°83 | d<br>43°22 | d<br>224 | d<br>451°85 |
| 1851°0  | 352°64062  | 3°96283      | 8°935      | 5°55      | 2°7199      | 2°0632      | 5°17      | 5°81      | 3°79      | 6°95       | 188      | 359°18      |
| *1852°0 | 358°58151  | 2°31462      | 10°761     | 5°33      | 2°7875      | 2°1675      | 1°86      | 2°46      | 2°75      | 20°85      | 151      | 266°50      |
| 1853°0  | 54°84005   | 1°66641      | 1°064      | 6°11      | 3°8552      | 3°2718      | 6°49      | 0°10      | 2°71      | 35°74      | 116      | 174°83      |
| 1854°0  | 60°78095   | 0°01819      | 2°890      | 5°88      | 3°9228      | 3°3761      | 3°18      | 3°70      | 1°67      | 49°63      | 80       | 82°15       |
| 1855°0  | 66°72185   | 5°42091      | 4°715      | 5°66      | 3°9905      | 3°4804      | 6°81      | 0°35      | 0°63      | 13°37      | 44       | 447°15      |
| *1856°0 | 72°66274   | 3°77270      | 6°541      | 5°44      | 4°0581      | 3°5847      | 3°50      | 3°95      | 6°77      | 27°26      | 8        | 354°48      |
| 1857°0  | 128°92128  | 3°12449      | 9°367      | 6°21      | 5°1258      | 4°6890      | 1°18      | 1°60      | 6°72      | 42°16      | 374      | 262°80      |
| 1858°0  | 134°86218  | 1°47628      | 11°193     | 5°99      | 5°1935      | 4°7934      | 4°82      | 5°20      | 5°68      | 5°90       | 338      | 170°13      |
| 1859°0  | 140°80308  | 6°87900      | 0°495      | 5°77      | 5°2611      | 4°8977      | 1°50      | 1°85      | 4°64      | 19°79      | 302      | 77°45       |
| *1860°0 | 146°74397  | 5°23078      | 2°321      | 5°54      | 5°3288      | 5°0020      | 5°14      | 5°45      | 3°60      | 33°68      | 265      | 442°45      |
| 1861°0  | 203°00251  | 4°58257      | 5°147      | 6°31      | 6°3964      | 6°1063      | 2°82      | 3°10      | 3°56      | 48°58      | 230      | 350°78      |
| 1862°0  | 208°94341  | 2°93436      | 6°973      | 6°09      | 6°4641      | 6°2106      | 6°46      | 6°70      | 2°52      | 12°31      | 194      | 258°10      |
| 1863°0  | 214°88431  | 1°28615      | 8°799      | 5°87      | 6°5317      | 6°3149      | 3°14      | 3°35      | 1°48      | 26°21      | 158      | 165°43      |
| *1864°0 | 220°82520  | 6°68887      | 10°624     | 5°65      | 6°5994      | 6°4192      | 6°78      | 0°00      | 0°44      | 40°10      | 122      | 72°75       |
| 1865°0  | 277°08374  | 6°04066      | 0°927      | 6°42      | 0°5115      | 0°3687      | 4°46      | 4°60      | 0°40      | 4°84       | 87       | 438°75      |
| 1866°0  | 283°02464  | 4°39245      | 2°753      | 6°20      | 0°5791      | 0°4730      | 1°15      | 1°25      | 6°53      | 18°73      | 50       | 346°08      |
| 1867°0  | 288°96554  | 2°74424      | 4°579      | 5°98      | 0°6468      | 0°5773      | 4°78      | 4°85      | 5°49      | 32°63      | 14       | 253°40      |
| *1868°0 | 294°90643  | 1°09603      | 6°404      | 5°75      | 0°7144      | 0°6816      | 1°47      | 1°50      | 4°45      | 46°52      | 379      | 160°73      |
| 1869°0  | 351°16497  | 0°44782      | 9°230      | 6°53      | 1°7821      | 1°7859      | 6°10      | 6°10      | 4°41      | 11°26      | 344      | 69°06       |
| 1870°0  | 357°10587  | 5°85053      | 11°056     | 6°30      | 1°8498      | 1°8902      | 2°79      | 2°75      | 3°37      | 25°15      | 308      | 434°06      |
| 1871°0  | 3°04676    | 4°20232      | 0°359      | 6°08      | 1°9174      | 1°9945      | 6°42      | 6°35      | 2°33      | 39°05      | 272      | 341°38      |
| *1872°0 | 8°98766    | 2°55411      | 2°184      | 5°86      | 1°9851      | 2°0988      | 3°11      | 2°99      | 1°29      | 2°78       | 236      | 248°71      |
| 1873°0  | 65°24620   | 1°90590      | 5°010      | 6°63      | 3°0527      | 3°2032      | 0°79      | 0°64      | 1°25      | 17°68      | 200      | 157°03      |
| 1874°0  | 71°18710   | 0°25769      | 6°836      | 6°41      | 3°1204      | 3°3075      | 4°43      | 4°24      | 0°21      | 31°57      | 164      | 64°36       |
| 1875°0  | 77°12799   | 5°66041      | 8°662      | 6°19      | 3°1880      | 3°4118      | 1°11      | 0°89      | 6°34      | 45°47      | 128      | 429°36      |
| *1876°0 | 83°06889   | 4°01219      | 10°488     | 5°96      | 3°2557      | 3°5161      | 4°75      | 4°49      | 5°30      | 9°20       | 92       | 336°68      |
| 1877°0  | 139°32743  | 3°36398      | 0°790      | 6°74      | 4°3233      | 4°6204      | 2°43      | 2°14      | 5°26      | 24°10      | 57       | 245°01      |
| 1878°0  | 145°26833  | 1°71577      | 2°616      | 6°51      | 4°3910      | 4°7247      | 6°07      | 5°74      | 4°22      | 37°99      | 21       | 152°33      |
| 1879°0  | 151°20922  | 0°06756      | 4°442      | 6°29      | 4°4586      | 4°8290      | 2°75      | 2°39      | 3°18      | 1°73       | 386      | 59°66       |
| *1880°0 | 157°15012  | 5°47028      | 6°268      | 6°07      | 4°5263      | 4°9333      | 6°39      | 5°99      | 2°14      | 15°62      | 350      | 424°66      |
| 1881°0  | 213°40866  | 4°82207      | 9°093      | 6°84      | 5°5939      | 6°0376      | 4°07      | 3°64      | 2°10      | 30°51      | 314      | 332°98      |
| 1882°0  | 219°34956  | 3°17386      | 10°919     | 6°62      | 5°6616      | 6°1419      | 0°76      | 0°29      | 1°06      | 44°41      | 278      | 240°31      |
| 1883°0  | 225°29045  | 1°52565      | 0°222      | 6°39      | 5°7292      | 6°2462      | 4°39      | 3°89      | 0°02      | 8°15       | 242      | 147°63      |
| *1884°0 | 231°23135  | 6°92836      | 2°048      | 6°17      | 5°7969      | 6°3505      | 1°08      | 0°54      | 6°15      | 22°04      | 206      | 54°96       |
| 1885°0  | 287°48989  | 6°28015      | 4°873      | 6°95      | 6°8645      | 0°3000      | 5°71      | 5°14      | 6°11      | 36°93      | 171      | 420°96      |
| 1886°0  | 293°43079  | 4°63194      | 6°699      | 6°72      | 6°9322      | 0°4043      | 2°40      | 1°79      | 5°07      | 0°67       | 135      | 328°28      |
| 1887°0  | 299°37168  | 2°98373      | 8°525      | 6°50      | 6°9998      | 0°5086      | 6°03      | 5°39      | 4°03      | 14°56      | 98       | 235°61      |
| *1888°0 | 305°31258  | 1°33552      | 10°351     | 6°28      | 7°0675      | 0°6130      | 2°72      | 2°04      | 2°99      | 28°46      | 62       | 142°93      |
| 1889°0  | 1°57112    | 0°68731      | 0°653      | 7°05      | 0°9796      | 1°7173      | 0°40      | 6°64      | 2°95      | 43°35      | 27       | 51°26       |
| 1890°0  | 7°51202    | 6°09003      | 2°479      | 6°83      | 1°0473      | 1°8216      | 4°04      | 3°29      | 1°91      | 7°09       | 392      | 416°26      |
| 1891°0  | 13°45291   | 4°44182      | 4°305      | 6°60      | 1°1149      | 1°9259      | 0°72      | 6°88      | 0°87      | 20°98      | 356      | 323°58      |
| *1892°0 | 19°39381   | 2°79360      | 6°131      | 6°38      | 1°1826      | 2°0302      | 4°36      | 3°53      | 7°01      | 34°88      | 320      | 230°91      |
| 1893°0  | 75°65235   | 2°14539      | 8°957      | 0°00      | 2°2502      | 3°1345      | 2°04      | 1°18      | 6°96      | 49°77      | 285      | 139°23      |
| 1894°0  | 81°59325   | 0°49718      | 10°782     | 6°93      | 2°3179      | 3°2388      | 5°68      | 4°78      | 5°92      | 13°51      | 249      | 46°56       |
| 1895°0  | 87°53414   | 5°89990      | 0°085      | 6°71      | 2°3855      | 3°3431      | 2°36      | 1°43      | 4°88      | 27°40      | 212      | 411°56      |
| *1896°0 | 93°47504   | 4°25169      | 1°911      | 6°49      | 2°4532      | 3°4474      | 6°00      | 5°03      | 3°84      | 41°30      | 176      | 318°88      |
| 1897°0  | 149°73358  | 3°60348      | 4°737      | 0°10      | 3°5208      | 4°5517      | 3°68      | 2°68      | 3°80      | 6°03       | 141      | 227°21      |
| 1898°0  | 155°67448  | 1°95527      | 6°562      | 7°04      | 3°5885      | 4°6560      | 0°37      | 6°28      | 2°76      | 19°93      | 105      | 134°53      |
| 1899°0  | 161°61537  | 0°30706      | 8°388      | 6°81      | 3°6561      | 4°7603      | 4°00      | 2°93      | 1°72      | 33°82      | 69       | 41°86       |
| 1900°0  | 167°55628  | 5°70977      | 10°214     | 6°59      | 3°7238      | 4°8646      | 0°69      | 6°53      | 0°68      | 47°72      | 33       | 406°86      |
| Periods | ...        | 7°05093      | 12°523     | 7°16      | 7°1555      | 7°1548      | 6°95      | 6°95      | 7°18      | 50°16      | 401      | 457°67      |

Constant applied to entries in Column 2:  $-0^{\circ}.47000$ .

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### XI Values at Epoch of Mean Longitude and the Arguments

| 4      | 5      | 6      | 7       | 8       | 9    |       |      |             | 3         | 4     | 5        |
|--------|--------|--------|---------|---------|------|-------|------|-------------|-----------|-------|----------|
| L      | M      |        | N       | O       | P    | Q     | R    | S           | T         | U     | V        |
| 05 04  | 53 48  | 1785 1 | 1850 0  | 0 63 48 | 10   | 889   | 3 38 | a<br>5 1475 | a<br>3 57 | 6 117 | a<br>7 0 |
| 87 74  | 132 89 | 15     | 1851 0  | 0 749 9 | 34   | 3 033 | 3 50 | 5 3161      | 3 9       | 6 48  | 5 9      |
| 45 74  | 1 30   | 515 4  | 1852 0  | 86710   | 2 57 | 3 176 | 0 05 | 5 4848      | 4 8       | 6 379 | 4 8      |
| 336 44 | 378 3  | 881 5  | 1853 0  | 1 9849  | 0 3  | 0 74  | 1 18 | 6 6534      | 5 63      | 0 355 | 4 7      |
| 19 14  | 57 71  | 3 46 5 | 1854 0  | 1 271   | 0 47 | 0 885 | 1 30 | 6 8 1       | 5 99      | 0 486 | 3 6      |
| 101 83 | 137 1  | 3611 7 | 1855 0  | 2 2 5   | 71   | 1 0 9 | 1 4  | 6 9907      | 6 34      | 0 617 | 5        |
| 466 83 | 16 53  | 3976 4 | *1856 0 | 33833   | 94   | 1 17  | 1 55 | 0 0 58      | 6 70      | 0 748 | 1 4      |
| 350 53 | 38 53  | 9 7    | 1857 0  | 3 45613 | 2 18 | 2 315 | 2 67 | 1 1745      | 0 90      | 1 878 | 1 3      |
| 33 3   | 61 95  | 374 6  | 1858 0  | 3 57394 | 2 41 | 2 458 | 80   | 1 343       | 1 26      | 0 9   | 0 2      |
| 115 93 | 141 35 | 739 6  | 1859 0  | 3 69175 | 65   | 601   | 9    | 1 5118      | 1 61      | 2 140 | 6 3      |
| 480 93 | 0 76   | 1104 7 | 1860 0  | 3 8 956 | 2 89 | 2 745 | 3 05 | 1 6805      | 1 97      | 2 71  | 5 2      |
| 364 63 | 386 76 | 147 9  | 1861 0  | 4 9 736 | 0 55 | 0 311 | 59   | 8491        | 3 3       | 3 402 | 5 1      |
| 247 33 | 66 17  | 1836   | 1862 0  | 5 4517  | 0 78 | 0 454 | 0 72 | 3 0178      | 3 68      | 3 532 | 4 0      |
| 13     | 145 58 | 1      | 1863 0  | 5 16 98 | 1 02 | 0 597 | 0 84 | 3 1865      | 4 03      | 3 663 | 2 9      |
| 7      | 4 99   | 566    | 1864 0  | 5 8079  | 1 6  | 0 741 | 96   | 3 3551      | 4 39      | 3 714 | 1 8      |
| 378 72 | 390 99 | 931 3  | 1865 0  | 6 39859 | 2 49 | 1 884 | 2 09 | 4 5238      | 5 74      | 4 9 5 | 1 8      |
| 61 42  | 270 40 | 3 95 8 | 1866 0  | 6 51640 | 2 73 | 2 027 | 2 1  | 4 6924      | 6 10      | 5 055 | 0 7      |
| 144 1  | 149 81 | 3659 9 | 1867 0  | 6 634 1 | 97   | 170   | 2 34 | 4 8611      | 6 45      | 5 186 | 6 7      |
| 6 8    | 9 22   | 4024 7 | *1868 0 | 6 75 02 | 3 0  | 2 314 | 46   | 5 0297      | 6 81      | 5 317 | 5 7      |
| 39 82  | 395 22 | 58 1   | 1869 0  | 715 7   | 0 86 | 3 457 | 0 1  | 6 1984      | 1 01      | 6 448 | 5 6      |
| 275 51 | 74 63  | 423 5  | 1870 0  | 0 83308 | 1 10 | 0 0 3 | 0 13 | 6 3671      | 1 37      | 6 579 | 4 5      |
| 158 21 | 154 4  | 789 2  | 1871 0  | 0 95089 | 1 34 | 0 166 | 0 6  | 6 5357      | 1 72      | 6 7 9 | 3 4      |
| 4 91   | 33 45  | 1155 0 | 1872 0  | 1 6869  | 1 57 | 0 309 | 0 38 | 6 7044      | 2 08      | 6 840 | 2 3      |
| 4 6 91 | 399 45 | 15 1 6 | 1873 0  | 18650   | 2 81 | 1 453 | 1 51 | 0 7195      | 3 43      | 0 817 | 2 2      |
| 89 61  | 78 86  | 1886 9 | 1874 0  | 30431   | 3 05 | 1 596 | 1 63 | 0 8881      | 3 79      | 0 948 | 1 1      |
| 17 31  | 158 27 | 2251 8 | 1875 0  | 4 21    | 3 28 | 1 739 | 1 75 | 1 0568      | 4 14      | 1 078 | 0 0      |
| 55 00  | 37 68  | 2616   | 1876 0  | 2 5399  | 3 5  | 1 88  | 1 88 | 1 2 55      | 4 50      | 1 209 | 6 1      |
| 4 1 00 | 403 68 | 981 5  | 1877 0  | 3 65773 | 1 18 | 3 0 6 | 3 00 | 3941        | 5 85      | 2 340 | 6 0      |
| 303 70 | 83 09  | 3345 8 | 1878 0  | 3 77554 | 1 4  | 3 169 | 3 13 | 2 5628      | 6 1       | 2 471 | 4 9      |
| 186 40 | 16 51  | 3710 2 | 1879 0  | 3 89335 | 1 65 | 3 312 | 3 25 | 2 7314      | 6 56      | 2 602 | 3 8      |
| 69 10  | 41 9   | 4075 1 | *1880 0 | 4 1115  | 1 89 | 3 455 | 3 38 | 2 9001      | 6 92      | 2 732 | 2 7      |
| 435 10 | 407 9  | 108 8  | 1881 0  | 5 12896 | 3 13 | 1 0 2 | 0 92 | 4 0687      | 1 12      | 3 863 | 2 6      |
| 3 7 80 | 287 33 | 474 4  | 1882 0  | 5 4677  | 3 36 | 1 165 | 1 05 | 4 374       | 1 48      | 3 994 | 1 5      |
| 200 49 | 166 74 | 84 0   | 1883 0  | 5 36458 | 02   | 1 308 | 1 17 | 4 4061      | 1 83      | 4 1 4 | 0 4      |
| 83 19  | 46 15  | 1 5 4  | 1884 0  | 5 48 38 | 0 6  | 1 451 | 1 30 | 4 5747      | 2 19      | 4 256 | 6 5      |
| 449 19 | 41 15  | 1571 5 | 1885 0  | 6 60019 | 1 50 | 595   | 4    | 5 7434      | 3 54      | 5 386 | 6 4      |
| 331 89 | 91 56  | 1936 3 | 1886 0  | 6 71800 | 1 73 | 2 738 | 54   | 5 9120      | 3 90      | 5 517 | 5 3      |
| 214 59 | 170 97 | 300 9  | 1887 0  | 6 83581 | 1 97 | 881   | 67   | 6 0807      | 4 5       | 5 648 | 4        |
| 97 9   | 50 38  | 665 5  | 1888 0  | 6 95361 |      | 3 024 | 2 79 | 6 494       | 4 61      | 5 779 | 3 1      |
| 463 9  | 416 38 | 3 31   | 1889 0  | 0 91687 | 3 44 | 0 590 | 0 34 | 0 645       | 5 96      | 6 910 | 3 0      |
| 345 99 | 295 79 | 3396 1 | 1890 0  | 1 03467 | 1    | 0 733 | 0 46 | 0 4331      | 6 32      | 7 040 | 2 0      |
| 8 68   | 175 20 | 3761 4 | 1891 0  | 1 15 48 | 0 34 | 0 877 | 0 59 | 6018        | 6 67      | 0 017 | 0 9      |
| 111 38 | 54 61  | 4126 8 | 1892 0  | 1 7029  | 0 57 | 1 0 0 | 0 71 | 0 77 4      | 7 0       | 0 148 | 6 9      |
| 477 38 | 4 0 61 | 160 6  | 1893 0  | 38810   | 1 81 | 163   | 1 84 | 1 9391      | 1 23      | 1 78  | 6 9      |
| 36 8   | 3 0    | 5 6 0  | 1894 0  | 5 590   | 05   | 2 307 | 1 96 | 1078        | 1 59      | 1 4 9 | 5 8      |
| 4 78   | 179 43 | 891    | 1895 0  | 2 62371 | 2 8  | 2 45  | 2 09 | 2764        | 1 94      | 1 540 | 4 7      |
| 1 5 48 | 58 84  | 1 56 1 | *1896 0 | 7415    | 5    | 2 593 | 1    | 2 4451      | 30        | 1 671 | 3 6      |
| 9 17   | 4 4 84 | 16 1 9 | 1897 0  | 3 85933 | 0 18 | 0 159 | 3 33 | 3 6137      | 3 65      | 2 802 | 3 5      |
| 374 17 | 304 25 | 1986 5 | 1898 0  | 3 97713 | 0 4  | 0 3 3 | 3 46 | 3 78 4      | 4 01      | 2 932 | 2 4      |
| 56 87  | 183 66 | 351 2  | 1899 0  | 4 09494 | 0 65 | 0 446 | 01   | 3 9510      | 4 36      | 3 063 | 1 3      |
| 139 57 | 63 07  | 716 0  | 1900 0  | 4 1 75  | 0 89 | 0 589 | 0 13 | 4 1197      | 4 7       | 3 194 | 0 2      |
| 48 30  | 485 59 | 4332 6 | P 10ds  | 7 15455 | 3 58 | 3 577 | 3 58 | 7 1536      | 7 15      | 7 154 | 7 2      |

T bt th Tu L git d l dt J pit O bit th ti fCl m m tb ppl m t d by th q tl f T bl XII XXVII

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XI continued Values at Epoch of Mean Longitude and the Arguments

| 1                  | 2                      | 3                      | 4                     | 5                   | 6                     | 7                     | 8                   | 9                   | 10                  | 11                   | 12   | 13                    |
|--------------------|------------------------|------------------------|-----------------------|---------------------|-----------------------|-----------------------|---------------------|---------------------|---------------------|----------------------|------|-----------------------|
| Date               | Mean Long.             | A                      | B                     | C                   | D                     | E                     | F                   | G                   | H                   | I                    | J    | K                     |
| 1900 <sup>o</sup>  | 167 <sup>o</sup> 55628 | d 5 <sup>o</sup> 70977 | d 10 <sup>o</sup> 214 | d 6 <sup>o</sup> 59 | d 3 <sup>o</sup> 7238 | d 4 <sup>o</sup> 8646 | d 0 <sup>o</sup> 69 | d 6 <sup>o</sup> 53 | d 0 <sup>o</sup> 68 | d 47 <sup>o</sup> 72 | d 33 | d 406 <sup>o</sup> 86 |
| 1901 <sup>o</sup>  | 173 <sup>o</sup> 49718 | 4 <sup>o</sup> 06156   | 12 <sup>o</sup> 040   | 6 <sup>o</sup> 37   | 3 <sup>o</sup> 7915   | 4 <sup>o</sup> 9690   | 4 <sup>o</sup> 32   | 3 <sup>o</sup> 18   | 6 <sup>o</sup> 81   | 11 <sup>o</sup> 45   | 398  | 314 <sup>o</sup> 19   |
| 1902 <sup>o</sup>  | 179 <sup>o</sup> 43807 | 2 <sup>o</sup> 41335   | 1 <sup>o</sup> 342    | 6 <sup>o</sup> 14   | 3 <sup>o</sup> 8591   | 5 <sup>o</sup> 0733   | 1 <sup>o</sup> 01   | 6 <sup>o</sup> 78   | 5 <sup>o</sup> 77   | 25 <sup>o</sup> 35   | 361  | 221 <sup>o</sup> 51   |
| 1903 <sup>o</sup>  | 185 <sup>o</sup> 37897 | 0 <sup>o</sup> 76514   | 3 <sup>o</sup> 168    | 5 <sup>o</sup> 92   | 3 <sup>o</sup> 9268   | 5 <sup>o</sup> 1776   | 4 <sup>o</sup> 64   | 3 <sup>o</sup> 43   | 4 <sup>o</sup> 73   | 39 <sup>o</sup> 24   | 325  | 128 <sup>o</sup> 84   |
| *1904 <sup>o</sup> | 191 <sup>o</sup> 31986 | 6 <sup>o</sup> 16786   | 4 <sup>o</sup> 994    | 5 <sup>o</sup> 69   | 3 <sup>o</sup> 9944   | 5 <sup>o</sup> 2819   | 1 <sup>o</sup> 33   | 0 <sup>o</sup> 08   | 3 <sup>o</sup> 69   | 2 <sup>o</sup> 98    | 289  | 36 <sup>o</sup> 16    |
| 1905 <sup>o</sup>  | 247 <sup>o</sup> 57841 | 5 <sup>o</sup> 51965   | 7 <sup>o</sup> 820    | 6 <sup>o</sup> 47   | 5 <sup>o</sup> 0621   | 6 <sup>o</sup> 3862   | 5 <sup>o</sup> 96   | 4 <sup>o</sup> 68   | 3 <sup>o</sup> 65   | 17 <sup>o</sup> 87   | 254  | 402 <sup>o</sup> 16   |
| 1906 <sup>o</sup>  | 253 <sup>o</sup> 51930 | 3 <sup>o</sup> 87144   | 9 <sup>o</sup> 646    | 6 <sup>o</sup> 25   | 5 <sup>o</sup> 1297   | 6 <sup>o</sup> 4905   | 2 <sup>o</sup> 65   | 1 <sup>o</sup> 33   | 2 <sup>o</sup> 61   | 31 <sup>o</sup> 76   | 218  | 309 <sup>o</sup> 49   |
| 1907 <sup>o</sup>  | 259 <sup>o</sup> 46020 | 2 <sup>o</sup> 22323   | 11 <sup>o</sup> 471   | 6 <sup>o</sup> 02   | 5 <sup>o</sup> 1974   | 6 <sup>o</sup> 5948   | 6 <sup>o</sup> 28   | 4 <sup>o</sup> 93   | 1 <sup>o</sup> 57   | 45 <sup>o</sup> 66   | 182  | 216 <sup>o</sup> 81   |
| *1908 <sup>o</sup> | 265 <sup>o</sup> 40109 | 0 <sup>o</sup> 57501   | 0 <sup>o</sup> 774    | 5 <sup>o</sup> 80   | 5 <sup>o</sup> 2650   | 6 <sup>o</sup> 6991   | 2 <sup>o</sup> 97   | 1 <sup>o</sup> 58   | 0 <sup>o</sup> 53   | 9 <sup>o</sup> 40    | 145  | 124 <sup>o</sup> 14   |
| 1909 <sup>o</sup>  | 321 <sup>o</sup> 65964 | 6 <sup>o</sup> 97773   | 3 <sup>o</sup> 600    | 6 <sup>o</sup> 58   | 6 <sup>o</sup> 3327   | 0 <sup>o</sup> 6486   | 0 <sup>o</sup> 66   | 6 <sup>o</sup> 18   | 0 <sup>o</sup> 49   | 24 <sup>o</sup> 29   | 110  | 32 <sup>o</sup> 46    |
| 1910 <sup>o</sup>  | 327 <sup>o</sup> 60053 | 5 <sup>o</sup> 32952   | 5 <sup>o</sup> 426    | 6 <sup>o</sup> 35   | 6 <sup>o</sup> 4003   | 0 <sup>o</sup> 7529   | 4 <sup>o</sup> 29   | 2 <sup>o</sup> 82   | 6 <sup>o</sup> 62   | 38 <sup>o</sup> 18   | 74   | 397 <sup>o</sup> 46   |
| 1911 <sup>o</sup>  | 333 <sup>o</sup> 54143 | 3 <sup>o</sup> 68131   | 7 <sup>o</sup> 251    | 6 <sup>o</sup> 13   | 6 <sup>o</sup> 4680   | 0 <sup>o</sup> 8572   | 0 <sup>o</sup> 98   | 6 <sup>o</sup> 42   | 5 <sup>o</sup> 58   | 1 <sup>o</sup> 92    | 38   | 304 <sup>o</sup> 78   |
| *1912 <sup>o</sup> | 339 <sup>o</sup> 48232 | 2 <sup>o</sup> 03310   | 9 <sup>o</sup> 077    | 5 <sup>o</sup> 90   | 6 <sup>o</sup> 5356   | 0 <sup>o</sup> 9615   | 4 <sup>o</sup> 61   | 3 <sup>o</sup> 07   | 4 <sup>o</sup> 54   | 15 <sup>o</sup> 81   | 2    | 212 <sup>o</sup> 11   |
| 1913 <sup>o</sup>  | 35 <sup>o</sup> 74087  | 1 <sup>o</sup> 38489   | 11 <sup>o</sup> 903   | 6 <sup>o</sup> 68   | 0 <sup>o</sup> 4478   | 2 <sup>o</sup> 0658   | 2 <sup>o</sup> 30   | 0 <sup>o</sup> 72   | 4 <sup>o</sup> 50   | 30 <sup>o</sup> 71   | 368  | 120 <sup>o</sup> 44   |
| 1914 <sup>o</sup>  | 41 <sup>o</sup> 68176  | 6 <sup>o</sup> 78760   | 1 <sup>o</sup> 206    | 6 <sup>o</sup> 46   | 0 <sup>o</sup> 5154   | 2 <sup>o</sup> 1701   | 5 <sup>o</sup> 93   | 4 <sup>o</sup> 32   | 3 <sup>o</sup> 46   | 44 <sup>o</sup> 60   | 332  | 27 <sup>o</sup> 76    |
| 1915 <sup>o</sup>  | 47 <sup>o</sup> 62266  | 5 <sup>o</sup> 13939   | 3 <sup>o</sup> 031    | 6 <sup>o</sup> 23   | 0 <sup>o</sup> 5831   | 2 <sup>o</sup> 2744   | 2 <sup>o</sup> 62   | 0 <sup>o</sup> 97   | 2 <sup>o</sup> 42   | 8 <sup>o</sup> 34    | 296  | 392 <sup>o</sup> 76   |
| *1916 <sup>o</sup> | 53 <sup>o</sup> 56355  | 3 <sup>o</sup> 49118   | 4 <sup>o</sup> 857    | 6 <sup>o</sup> 01   | 0 <sup>o</sup> 6507   | 2 <sup>o</sup> 3788   | 6 <sup>o</sup> 25   | 4 <sup>o</sup> 57   | 1 <sup>o</sup> 38   | 22 <sup>o</sup> 23   | 259  | 300 <sup>o</sup> 09   |
| 1917 <sup>o</sup>  | 109 <sup>o</sup> 82210 | 2 <sup>o</sup> 84297   | 7 <sup>o</sup> 683    | 6 <sup>o</sup> 79   | 1 <sup>o</sup> 7184   | 3 <sup>o</sup> 4831   | 3 <sup>o</sup> 94   | 2 <sup>o</sup> 22   | 1 <sup>o</sup> 34   | 37 <sup>o</sup> 13   | 224  | 208 <sup>o</sup> 41   |
| 1918 <sup>o</sup>  | 115 <sup>o</sup> 76299 | 1 <sup>o</sup> 19476   | 9 <sup>o</sup> 509    | 6 <sup>o</sup> 56   | 1 <sup>o</sup> 7860   | 3 <sup>o</sup> 5874   | 0 <sup>o</sup> 62   | 5 <sup>o</sup> 82   | 0 <sup>o</sup> 30   | 0 <sup>o</sup> 86    | 188  | 115 <sup>o</sup> 74   |
| 1919 <sup>o</sup>  | 121 <sup>o</sup> 70389 | 6 <sup>o</sup> 59748   | 11 <sup>o</sup> 335   | 6 <sup>o</sup> 34   | 1 <sup>o</sup> 8537   | 3 <sup>o</sup> 6917   | 4 <sup>o</sup> 26   | 2 <sup>o</sup> 47   | 6 <sup>o</sup> 43   | 14 <sup>o</sup> 76   | 152  | 23 <sup>o</sup> 06    |
| *1920 <sup>o</sup> | 127 <sup>o</sup> 64478 | 4 <sup>o</sup> 94927   | 0 <sup>o</sup> 637    | 6 <sup>o</sup> 11   | 1 <sup>o</sup> 9213   | 3 <sup>o</sup> 7960   | 0 <sup>o</sup> 94   | 6 <sup>o</sup> 07   | 5 <sup>o</sup> 39   | 28 <sup>o</sup> 65   | 116  | 388 <sup>o</sup> 06   |
| 1921 <sup>o</sup>  | 183 <sup>o</sup> 90332 | 4 <sup>o</sup> 30106   | 3 <sup>o</sup> 463    | 6 <sup>o</sup> 89   | 2 <sup>o</sup> 9890   | 4 <sup>o</sup> 9003   | 5 <sup>o</sup> 58   | 3 <sup>o</sup> 72   | 5 <sup>o</sup> 35   | 43 <sup>o</sup> 55   | 81   | 296 <sup>o</sup> 39   |
| 1922 <sup>o</sup>  | 189 <sup>o</sup> 84422 | 2 <sup>o</sup> 65285   | 5 <sup>o</sup> 289    | 6 <sup>o</sup> 67   | 3 <sup>o</sup> 0566   | 5 <sup>o</sup> 0046   | 2 <sup>o</sup> 26   | 0 <sup>o</sup> 37   | 4 <sup>o</sup> 31   | 7 <sup>o</sup> 28    | 44   | 203 <sup>o</sup> 71   |
| 1923 <sup>o</sup>  | 195 <sup>o</sup> 78512 | 1 <sup>o</sup> 00464   | 7 <sup>o</sup> 115    | 6 <sup>o</sup> 44   | 3 <sup>o</sup> 1243   | 5 <sup>o</sup> 1089   | 5 <sup>o</sup> 90   | 3 <sup>o</sup> 97   | 3 <sup>o</sup> 27   | 21 <sup>o</sup> 18   | 8    | 111 <sup>o</sup> 04   |
| *1924 <sup>o</sup> | 201 <sup>o</sup> 72601 | 6 <sup>o</sup> 40735   | 8 <sup>o</sup> 940    | 6 <sup>o</sup> 22   | 3 <sup>o</sup> 1919   | 5 <sup>o</sup> 2132   | 2 <sup>o</sup> 58   | 0 <sup>o</sup> 62   | 2 <sup>o</sup> 23   | 35 <sup>o</sup> 07   | 373  | 18 <sup>o</sup> 36    |
| 1925 <sup>o</sup>  | 257 <sup>o</sup> 98455 | 5 <sup>o</sup> 75914   | 11 <sup>o</sup> 766   | 7 <sup>o</sup> 00   | 4 <sup>o</sup> 2596   | 6 <sup>o</sup> 3175   | 0 <sup>o</sup> 27   | 5 <sup>o</sup> 22   | 2 <sup>o</sup> 19   | 49 <sup>o</sup> 97   | 338  | 384 <sup>o</sup> 36   |
| 1926 <sup>o</sup>  | 263 <sup>o</sup> 92545 | 4 <sup>o</sup> 11093   | 1 <sup>o</sup> 069    | 6 <sup>o</sup> 77   | 4 <sup>o</sup> 3272   | 6 <sup>o</sup> 4218   | 3 <sup>o</sup> 90   | 1 <sup>o</sup> 87   | 1 <sup>o</sup> 15   | 13 <sup>o</sup> 70   | 302  | 291 <sup>o</sup> 69   |
| 1927 <sup>o</sup>  | 269 <sup>o</sup> 86635 | 2 <sup>o</sup> 46272   | 2 <sup>o</sup> 895    | 6 <sup>o</sup> 55   | 4 <sup>o</sup> 3949   | 6 <sup>o</sup> 5261   | 0 <sup>o</sup> 59   | 5 <sup>o</sup> 47   | 0 <sup>o</sup> 11   | 27 <sup>o</sup> 60   | 266  | 199 <sup>o</sup> 01   |
| *1928 <sup>o</sup> | 275 <sup>o</sup> 80724 | 0 <sup>o</sup> 81451   | 4 <sup>o</sup> 720    | 6 <sup>o</sup> 32   | 4 <sup>o</sup> 4625   | 6 <sup>o</sup> 6304   | 4 <sup>o</sup> 22   | 2 <sup>o</sup> 12   | 6 <sup>o</sup> 24   | 41 <sup>o</sup> 49   | 230  | 106 <sup>o</sup> 34   |
| 1929 <sup>o</sup>  | 332 <sup>o</sup> 06578 | 0 <sup>o</sup> 16630   | 7 <sup>o</sup> 546    | 7 <sup>o</sup> 10   | 5 <sup>o</sup> 5302   | 0 <sup>o</sup> 5799   | 1 <sup>o</sup> 91   | 6 <sup>o</sup> 71   | 6 <sup>o</sup> 20   | 6 <sup>o</sup> 23    | 194  | 14 <sup>o</sup> 66    |
| 1930 <sup>o</sup>  | 338 <sup>o</sup> 00668 | 5 <sup>o</sup> 56901   | 9 <sup>o</sup> 372    | 6 <sup>o</sup> 88   | 5 <sup>o</sup> 5978   | 0 <sup>o</sup> 6842   | 5 <sup>o</sup> 54   | 3 <sup>o</sup> 36   | 5 <sup>o</sup> 16   | 20 <sup>o</sup> 12   | 158  | 379 <sup>o</sup> 66   |
| 1931 <sup>o</sup>  | 343 <sup>o</sup> 94758 | 3 <sup>o</sup> 92080   | 11 <sup>o</sup> 198   | 6 <sup>o</sup> 65   | 5 <sup>o</sup> 6655   | 0 <sup>o</sup> 7886   | 2 <sup>o</sup> 23   | 0 <sup>o</sup> 01   | 4 <sup>o</sup> 12   | 34 <sup>o</sup> 02   | 122  | 286 <sup>o</sup> 99   |
| *1932 <sup>o</sup> | 349 <sup>o</sup> 88847 | 2 <sup>o</sup> 27259   | 0 <sup>o</sup> 500    | 6 <sup>o</sup> 43   | 5 <sup>o</sup> 7332   | 0 <sup>o</sup> 8929   | 5 <sup>o</sup> 86   | 3 <sup>o</sup> 61   | 3 <sup>o</sup> 08   | 47 <sup>o</sup> 91   | 86   | 194 <sup>o</sup> 32   |
| 1933 <sup>o</sup>  | 46 <sup>o</sup> 14701  | 1 <sup>o</sup> 62438   | 3 <sup>o</sup> 326    | 0 <sup>o</sup> 04   | 6 <sup>o</sup> 8008   | 1 <sup>o</sup> 9972   | 3 <sup>o</sup> 55   | 1 <sup>o</sup> 26   | 3 <sup>o</sup> 04   | 12 <sup>o</sup> 65   | 51   | 102 <sup>o</sup> 64   |
| 1934 <sup>o</sup>  | 52 <sup>o</sup> 08791  | 7 <sup>o</sup> 02710   | 5 <sup>o</sup> 152    | 6 <sup>o</sup> 98   | 6 <sup>o</sup> 8685   | 2 <sup>o</sup> 1015   | 0 <sup>o</sup> 23   | 4 <sup>o</sup> 86   | 2 <sup>o</sup> 00   | 26 <sup>o</sup> 54   | 15   | 9 <sup>o</sup> 97     |
| 1935 <sup>o</sup>  | 58 <sup>o</sup> 02881  | 5 <sup>o</sup> 37889   | 6 <sup>o</sup> 978    | 6 <sup>o</sup> 76   | 6 <sup>o</sup> 9361   | 2 <sup>o</sup> 2058   | 3 <sup>o</sup> 87   | 1 <sup>o</sup> 51   | 0 <sup>o</sup> 96   | 40 <sup>o</sup> 43   | 380  | 374 <sup>o</sup> 97   |
| *1936 <sup>o</sup> | 63 <sup>o</sup> 96970  | 3 <sup>o</sup> 73068   | 8 <sup>o</sup> 804    | 6 <sup>o</sup> 53   | 7 <sup>o</sup> 0038   | 2 <sup>o</sup> 3101   | 0 <sup>o</sup> 55   | 5 <sup>o</sup> 11   | 7 <sup>o</sup> 10   | 4 <sup>o</sup> 17    | 344  | 282 <sup>o</sup> 29   |
| 1937 <sup>o</sup>  | 120 <sup>o</sup> 22824 | 3 <sup>o</sup> 08247   | 11 <sup>o</sup> 629   | 0 <sup>o</sup> 15   | 0 <sup>o</sup> 9159   | 3 <sup>o</sup> 4144   | 5 <sup>o</sup> 19   | 2 <sup>o</sup> 76   | 7 <sup>o</sup> 05   | 19 <sup>o</sup> 06   | 308  | 190 <sup>o</sup> 62   |
| 1938 <sup>o</sup>  | 126 <sup>o</sup> 16914 | 1 <sup>o</sup> 43426   | 0 <sup>o</sup> 932    | 7 <sup>o</sup> 09   | 0 <sup>o</sup> 9835   | 3 <sup>o</sup> 5187   | 1 <sup>o</sup> 87   | 6 <sup>o</sup> 36   | 6 <sup>o</sup> 01   | 32 <sup>o</sup> 96   | 272  | 97 <sup>o</sup> 94    |
| 1939 <sup>o</sup>  | 132 <sup>o</sup> 11004 | 6 <sup>o</sup> 83697   | 2 <sup>o</sup> 758    | 6 <sup>o</sup> 86   | 1 <sup>o</sup> 0512   | 3 <sup>o</sup> 6230   | 5 <sup>o</sup> 51   | 3 <sup>o</sup> 01   | 4 <sup>o</sup> 97   | 46 <sup>o</sup> 85   | 236  | 5 <sup>o</sup> 27     |
| *1940 <sup>o</sup> | 138 <sup>o</sup> 05093 | 5 <sup>o</sup> 18876   | 4 <sup>o</sup> 584    | 6 <sup>o</sup> 64   | 1 <sup>o</sup> 1188   | 3 <sup>o</sup> 7273   | 2 <sup>o</sup> 19   | 6 <sup>o</sup> 61   | 3 <sup>o</sup> 93   | 10 <sup>o</sup> 59   | 200  | 370 <sup>o</sup> 27   |
| 1941 <sup>o</sup>  | 194 <sup>o</sup> 30947 | 4 <sup>o</sup> 54055   | 7 <sup>o</sup> 409    | 0 <sup>o</sup> 25   | 2 <sup>o</sup> 1865   | 4 <sup>o</sup> 8316   | 6 <sup>o</sup> 82   | 4 <sup>o</sup> 26   | 3 <sup>o</sup> 89   | 25 <sup>o</sup> 48   | 165  | 278 <sup>o</sup> 59   |
| 1942 <sup>o</sup>  | 200 <sup>o</sup> 25037 | 2 <sup>o</sup> 89234   | 9 <sup>o</sup> 235    | 0 <sup>o</sup> 03   | 2 <sup>o</sup> 2541   | 4 <sup>o</sup> 9359   | 3 <sup>o</sup> 51   | 0 <sup>o</sup> 91   | 2 <sup>o</sup> 85   | 39 <sup>o</sup> 37   | 129  | 185 <sup>o</sup> 92   |
| 1943 <sup>o</sup>  | 206 <sup>o</sup> 19127 | 1 <sup>o</sup> 24413   | 11 <sup>o</sup> 061   | 6 <sup>o</sup> 97   | 2 <sup>o</sup> 3218   | 5 <sup>o</sup> 0402   | 0 <sup>o</sup> 20   | 4 <sup>o</sup> 51   | 1 <sup>o</sup> 81   | 3 <sup>o</sup> 11    | 92   | 93 <sup>o</sup> 24    |
| *1944 <sup>o</sup> | 212 <sup>o</sup> 13216 | 6 <sup>o</sup> 64685   | 0 <sup>o</sup> 364    | 6 <sup>o</sup> 74   | 2 <sup>o</sup> 3895   | 5 <sup>o</sup> 1446   | 3 <sup>o</sup> 83   | 1 <sup>o</sup> 16   | 0 <sup>o</sup> 77   | 17 <sup>o</sup> 01   | 56   | 0 <sup>o</sup> 57     |
| 1945 <sup>o</sup>  | 268 <sup>o</sup> 39070 | 5 <sup>o</sup> 99864   | 3 <sup>o</sup> 189    | 0 <sup>o</sup> 36   | 3 <sup>o</sup> 4571   | 6 <sup>o</sup> 2489   | 1 <sup>o</sup> 52   | 5 <sup>o</sup> 76   | 0 <sup>o</sup> 73   | 31 <sup>o</sup> 90   | 21   | 366 <sup>o</sup> 57   |
| 1946 <sup>o</sup>  | 274 <sup>o</sup> 33159 | 4 <sup>o</sup> 35042   | 5 <sup>o</sup> 015    | 0 <sup>o</sup> 14   | 3 <sup>o</sup> 5248   | 6 <sup>o</sup> 3532   | 5 <sup>o</sup> 15   | 2 <sup>o</sup> 41   | 6 <sup>o</sup> 86   | 45 <sup>o</sup> 80   | 386  | 273 <sup>o</sup> 89   |
| 1947 <sup>o</sup>  | 280 <sup>o</sup> 27250 | 2 <sup>o</sup> 70221   | 6 <sup>o</sup> 841    | 7 <sup>o</sup> 07   | 3 <sup>o</sup> 5924   | 6 <sup>o</sup> 4575   | 1 <sup>o</sup> 84   | 6 <sup>o</sup> 01   | 5 <sup>o</sup> 82   | 9 <sup>o</sup> 53    | 350  | 181 <sup>o</sup> 22   |
| *1948 <sup>o</sup> | 286 <sup>o</sup> 21339 | 1 <sup>o</sup> 05400   | 8 <sup>o</sup> 667    | 6 <sup>o</sup> 85   | 3 <sup>o</sup> 6601   | 6 <sup>o</sup> 5618   | 5 <sup>o</sup> 47   | 2 <sup>o</sup> 65   | 4 <sup>o</sup> 78   | 23 <sup>o</sup> 43   | 314  | 88 <sup>o</sup> 54    |
| 1949 <sup>o</sup>  | 342 <sup>o</sup> 47193 | 0 <sup>o</sup> 40579   | 11 <sup>o</sup> 493   | 0 <sup>o</sup> 46   | 4 <sup>o</sup> 7277   | 0 <sup>o</sup> 5113   | 3 <sup>o</sup> 16   | 0 <sup>o</sup> 30   | 4 <sup>o</sup> 74   | 38 <sup>o</sup> 32   | 279  | 454 <sup>o</sup> 54   |
| 1950 <sup>o</sup>  | 348 <sup>o</sup> 41283 | 5 <sup>o</sup> 80851   | 0 <sup>o</sup> 795    | 0 <sup>o</sup> 24   | 4 <sup>o</sup> 7954   | 0 <sup>o</sup> 6156   | 6 <sup>o</sup> 79   | 3 <sup>o</sup> 90   | 3 <sup>o</sup> 70   | 2 <sup>o</sup> 06    | 243  | 361 <sup>o</sup> 87   |
| Periods            | ...                    | 7 <sup>o</sup> 05093   | 12 <sup>o</sup> 523   | 7 <sup>o</sup> 16   | 7 <sup>o</sup> 1555   | 7 <sup>o</sup> 1548   | 6 <sup>o</sup> 95   | 6 <sup>o</sup> 95   | 7 <sup>o</sup> 18   | 50 <sup>o</sup> 16   | 401  | 457 <sup>o</sup> 67   |

Constant applied to entries in Column 2: -0<sup>o</sup>47000.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XI continued Values at Epoch of Mean Longitude and the Arguments

| 4           | 5      | 6        | 7       | 8       | 9         |       |      |             | 3         | 4          | 5        |
|-------------|--------|----------|---------|---------|-----------|-------|------|-------------|-----------|------------|----------|
| L           | M      | $\alpha$ | N       | O       | P         | Q     | R    | S           | T         | U          | V        |
| d<br>139 57 | 63 7   | 716      | 1900 O  | 4 1 75  | d<br>0 89 | 0 589 | 0 13 | d<br>4 1197 | d<br>4 72 | d<br>3 194 | d<br>0 2 |
| 7           | 4 8 07 | 308 1    | 1901 O  | 4 33 56 | 1 13      | 73    | 0 25 | 4 2884      | 5 08      | 3 325      | 6 3      |
| 387 7       | 307 48 | 3446 4   | 1902 O  | 4 44837 | 1 36      | 875   | 38   | 4 457       | 5 43      | 3 456      | 5 2      |
| 69 97       | 186 89 | 3811 6   | 1903 O  | 4 56617 | 1 60      | 1 019 | 0 50 | 4 6 57      | 5 79      | 3 586      | 4 1      |
| 15 66       | 66 3   | 4176 6   | 1904 O  | 4 68398 | 1 84      | 1 16  | 0 63 | 4 7943      | 6 14      | 3 717      | 3        |
| 36 36       | 432 3  | 209 9    | 1905 O  | 5 8 179 | 3 7       | 2 305 | 1 75 | 5 963       | 0 35      | 4 848      | 9        |
| 401 36      | 311 71 | 574 7    | 1906 O  | 5 9196  | 3 31      | 2 448 | 1 88 | 6 1316      | 0 70      | 4 979      | 1 8      |
| 84 06       | 191 12 | 939 5    | 1907 O  | 6 03740 | 3 55      | 592   | 2 00 | 6 30 3      | 1 06      | 5 110      | 0 7      |
| 166 76      | 7 53   | 13 4 4   | *1908 O | 6 155 1 | 1         | 2 735 | 12   | 6 4690      | 1 41      | 5 240      | 6 8      |
| 50 46       | 436 53 | 167 4    | 1909 O  | 0 11846 | 1 44      | 0 301 | 3 25 | 0 4841      | 2 77      | 6 371      | 6 7      |
| 415 46      | 315 94 | 35 4     | 1910 O  | 3627    | 1 68      | 0 444 | 3 37 | 0 6527      | 3 12      | 6 502      | 5 6      |
| 298 15      | 195 35 | 4 0 6    | 1911 O  | 0 35408 | 1 92      | 0 588 | 3 50 | 0 8 14      | 3 48      | 6 633      | 4 5      |
| 18 85       | 74 76  | 765 7    | 1912 O  | 0 47189 | 15        | 0 731 | 0 04 | 0 9900      | 3 83      | 6 764      | 3 4      |
| 64 55       | 440 76 | 3131 8   | 1913 O  | 1 58969 | 3 39      | 1 874 | 1 17 | 2 1587      | 5 1)      | 0 740      | 3 3      |
| 4 9 55      | 32 17  | 3496 8   | 1914 O  | 1 7075  | 0 5       | 0 17  | 1 29 | 3 74        | 5 54      | 0 871      | 3        |
| 31 25       | 199 58 | 3861 6   | 1915 O  | 1 82531 | 0 8       | 2 161 | 1 42 | 4960        | 5 90      | 1 00       | 1 2      |
| 194 95      | 78 99  | 4 6 4    | *1916 O | 1 9431  | 0 5       | 2 304 | 1 54 | 2 6647      | 6 25      | 1 132      | 0 1      |
| 78 65       | 444 99 | 59 5     | 1917 O  | 3 609   | 1 76      | 3 447 | 67   | 3 8333      | 0 46      | 2 63       | 7 1      |
| 443 65      | 324 40 | 6 4 5    | 1918 O  | 3 17873 | 1 99      | 0 013 | 79   | 4 0020      | 0 81      | 2 394      | 6 1      |
| 3 6 34      | 3 81   | 989 6    | 1919 O  | 3 29654 | 2 23      | 0 156 | 2 91 | 4 1707      | 1 17      | 2 5 5      | 5 0      |
| 09 04       | 83 2   | 1354 8   | 1920 O  | 3 41435 | 47        | 0 300 | 3 04 | 4 3393      | 1 52      | 2 656      | 3 9      |
| 9 74        | 449    | 1721 1   | 1921 O  | 4 53215 | 0 13      | 1 443 | 0 59 | 5 5080      | 2 88      | 3 786      | 3 8      |
| 457 74      | 3 8 63 | 86 5     | 1922 O  | 4 64996 | 0 36      | 1 586 | 0 71 | 5 6766      | 3 23      | 3 917      | 2 7      |
| 340 44      | 08 05  | 451 1    | 1923 O  | 4 76777 | 0 60      | 1 7 9 | 0 83 | 5 8453      | 3 59      | 4 048      | 1 6      |
| 2 3 14      | 87 46  | 816 0    | *1924 O | 4 88558 | 84        | 1 873 | 0 96 | 6 0139      | 3 94      | 4 179      | 0 5      |
| 106 83      | 453 46 | 3181 3   | 1925 O  | 6 0 338 | 7         | 3 016 | 2 8  | 0 0 90      | 5 30      | 5 310      | 0 4      |
| 471 83      | 33 87  | 3545 5   | 1926 O  | 6 1 119 | 31        | 3 159 | 21   | 0 1977      | 5 65      | 5 44       | 6 5      |
| 354 53      | 21 8   | 3909 8   | 1927 O  | 6 390   | 2 55      | 3 302 | 33   | 0 3664      | 6 01      | 5 571      | 5 4      |
| 37 3        | 91 69  | 4 74 5   | *1928 O | 6 35681 | 78        | 3 446 | 2 46 | 5350        | 6 36      | 5 702      | 4 3      |
| 1 0 93      | 457 69 | 3 8 0    | 1929 O  | 0 3 0 6 | 0 44      | 1 01  | 0 00 | 1 7037      | 0 57      | 6 833      | 4 2      |
| 3 63        | 337 10 | 673 6    | 1930 O  | 0 43787 | 0 68      | 1 155 | 0 13 | 1 8723      | 0 92      | 6 964      | 3 1      |
| 368 63      | 16 51  | 1039 3   | 1931 O  | 0 55568 | 0 92      | 1 298 | 0 25 | 0410        | 1 28      | 7 094      | 2 0      |
| 51 3        | 95 9   | 14 5 0   | *1932 O | 0 67348 | 1 15      | 1 441 | 38   | 2 2097      | 1 63      | 0 071      | 0 9      |
| 135 0       | 461 9  | 1771 6   | 1933 O  | 1 791 9 | 2 39      | 2 585 | 1 50 | 3 3783      | 2 99      | 1 202      | 0 8      |
| 17 7        | 341 33 | 2136 8   | 1934 O  | 1 9 910 | 63        | 728   | 1 62 | 3 5470      | 3 34      | 1 333      | 6 9      |
| 38 7        | 74     | 501 6    | 1935 O  | 2691    | 86        | 2 871 | 1 75 | 3 7156      | 3 70      | 1 463      | 5 8      |
| 65 4        | 1 0 15 | 2866 0   | 1936 O  | 14471   | 3 1       | 3 014 | 1 87 | 3 8843      | 4 05      | 1 594      | 4 7      |
| 149 1       | 466 15 | 3231     | 1937 O  | 3 625   | 76        | 0 581 | 3 00 | 5 05 9      | 5 41      | 2 725      | 4 6      |
| 3 81        | 345 56 | 3595 4   | 1938 O  | 3 38033 | 1 0       | 7 4   | 3 1  | 5 16        | 5 76      | 2 856      | 3 5      |
| 396 81      | 4 97   | 396 0    | 1939 O  | 3 49814 | 1 3       | 0 867 | 3 5  | 5 3903      | 6 12      | 2 986      | 2 5      |
| 279 51      | 104 38 | 4324 9   | *1940 O | 3 61594 | 1 47      | 1 010 | 3 37 | 5 5 89      | 6 47      | 3 117      | 1 4      |
| 163 1       | 47 38  | 358 7    | 1941 O  | 4 73375 | 7         | 154   | 0 9  | 6 7276      | 68        | 4 48       | 1 3      |
| 45 91       | 349 79 | 7 4 3    | 1942 O  | 4 85156 | 2 94      | 297   | 1 4  | 6 8962      | 1 3       | 4 379      | 0 2      |
| 41 91       | 9      | 1089 8   | 1943 O  | 4 96937 | 3 18      | 440   | 1 16 | 7 0649      | 1 39      | 4 510      | 6 3      |
| 93 61       | 108 61 | 1455 1   | 1944 O  | 5 08717 | 3 41      | 2 583 | 1 29 | 0 800       | 1 74      | 4 640      | 5 2      |
| 177 31      | 474 61 | 1821 1   | 1945 O  | 6 498   | 1 07      | 0 149 | 2 41 | 1 487       | 3 10      | 5 771      | 5 1      |
| 6 0         | 354 01 | 185 9    | 1946 O  | 6 32278 | 1 31      | 0 93  | 2 54 | 1 4173      | 3 45      | 5 902      | 4 0      |
| 425 00      | 33 43  | 550 5    | 1947 O  | 6 44060 | 1 55      | 0 436 | 2 66 | 1 586       | 3 81      | 6 033      | 9        |
| 307 70      | 11 84  | 915      | *1948 O | 6 5584  | 1 78      | 0 579 | 2 79 | 1 7546      | 4 16      | 6 164      | 1 8      |
| 191 40      | 478 84 | 3 81     | 1949 O  | 52166   | 3 0       | 1 7   | 0 33 | 9 33        | 5 52      | 0 140      | 1 7      |
| 74 1        | 358 5  | 3646     | 1950 O  | 0 63947 | 3 6       | 1 866 | 0 46 | 3 0919      | 5 87      | 0 71       | 0 6      |
| 48 3        | 485 59 | 433 6    | P ods   | 7 15455 | 3 58      | 3 577 | 3 58 | 7 1536      | 7 15      | 7 154      | 7 2      |

T bt tl T L git d d dt J pit O bt th ti f C I m m tb ppl m t d by tl q tl f T bl XII XXXII

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XI continued Values at Epoch of Mean Longitude and the Arguments

| 1       | 2          | 3       | 4      | 5    | 6      | 7      | 8    | 9    | 10   | 11    | 12  | 13     |
|---------|------------|---------|--------|------|--------|--------|------|------|------|-------|-----|--------|
| Date    | Mean Long. | A       | B      | C    | D      | E      | F    | G    | H    | I     | J   | K      |
|         | °          | d       | d      | d    | d      | d      | d    | d    | d    | d     | d   | d      |
| 1950·0  | 348·41283  | 5·80851 | 0·795  | 0·24 | 4·7954 | 0·6156 | 6·79 | 3·90 | 3·70 | 2·06  | 243 | 361·87 |
| 1951·0  | 354·35373  | 4·16030 | 2·621  | 0·02 | 4·8630 | 0·7199 | 3·48 | 0·55 | 2·66 | 15·95 | 206 | 269·19 |
| *1952·0 | 0·29462    | 2·51209 | 4·447  | 6·95 | 4·9307 | 0·8242 | 0·16 | 4·15 | 1·62 | 29·85 | 170 | 176·52 |
| 1953·0  | 56·55316   | 1·86388 | 7·273  | 0·57 | 5·9983 | 1·9285 | 4·80 | 1·80 | 1·58 | 44·74 | 135 | 84·84  |
| 1954·0  | 62·49406   | 0·21567 | 9·098  | 0·34 | 6·0660 | 2·0328 | 1·48 | 5·40 | 0·54 | 8·48  | 99  | 449·84 |
| 1955·0  | 68·43496   | 5·61838 | 10·924 | 0·12 | 6·1336 | 2·1371 | 5·12 | 2·05 | 6·67 | 22·37 | 63  | 357·17 |
| *1956·0 | 74·37585   | 3·97017 | 0·227  | 7·06 | 6·2013 | 2·2414 | 1·80 | 5·65 | 5·63 | 36·27 | 27  | 264·49 |
| 1957·0  | 130·63439  | 3·32196 | 3·053  | 0·67 | 0·1134 | 3·3457 | 6·44 | 3·30 | 5·59 | 1·00  | 393 | 172·82 |
| 1958·0  | 136·57529  | 1·67375 | 4·878  | 0·45 | 0·1811 | 3·4500 | 3·12 | 6·90 | 4·55 | 14·90 | 356 | 80·14  |
| 1959·0  | 142·51618  | 0·02554 | 6·704  | 0·22 | 0·2487 | 3·5544 | 6·76 | 3·55 | 3·51 | 28·79 | 320 | 445·14 |
| *1960·0 | 148·45708  | 5·42826 | 8·530  | 0·00 | 0·3164 | 3·6587 | 3·44 | 0·20 | 2·47 | 42·68 | 284 | 352·47 |
| 1961·0  | 204·71562  | 4·78005 | 11·356 | 0·78 | 1·3840 | 4·7630 | 1·13 | 4·80 | 2·43 | 7·42  | 249 | 260·79 |
| 1962·0  | 210·65652  | 3·13183 | 0·658  | 0·55 | 1·4517 | 4·8673 | 4·76 | 1·45 | 1·39 | 21·31 | 213 | 168·12 |
| 1963·0  | 216·59741  | 1·48362 | 2·484  | 0·33 | 1·5193 | 4·9716 | 1·45 | 5·05 | 0·35 | 35·21 | 177 | 75·45  |
| *1964·0 | 222·53831  | 6·88634 | 4·310  | 0·11 | 1·5870 | 5·0759 | 5·08 | 1·70 | 6·48 | 49·10 | 140 | 440·45 |
| 1965·0  | 278·79685  | 6·23813 | 7·136  | 0·88 | 2·6546 | 6·1802 | 2·77 | 6·30 | 6·44 | 13·84 | 105 | 348·77 |
| 1966·0  | 284·73775  | 4·58992 | 8·962  | 0·66 | 2·7223 | 6·2845 | 6·40 | 2·95 | 5·40 | 27·73 | 69  | 256·10 |
| 1967·0  | 290·67804  | 2·94171 | 10·787 | 0·43 | 2·7899 | 6·3888 | 3·09 | 6·54 | 4·36 | 41·63 | 33  | 163·42 |
| *1968·0 | 296·61954  | 1·29350 | 0·090  | 0·21 | 2·8576 | 6·4931 | 6·72 | 3·19 | 3·32 | 5·36  | 398 | 70·75  |
| 1969·0  | 352·87808  | 0·64529 | 2·916  | 0·99 | 3·9252 | 0·4426 | 4·41 | 0·84 | 3·28 | 20·26 | 363 | 436·75 |
| 1970·0  | 358·81898  | 6·04800 | 4·742  | 0·76 | 3·9929 | 0·5469 | 1·09 | 4·44 | 2·24 | 34·15 | 327 | 344·07 |
| 1971·0  | 4·75987    | 4·39979 | 6·567  | 0·54 | 4·0605 | 0·6512 | 4·73 | 1·09 | 1·20 | 48·05 | 291 | 251·40 |
| *1972·0 | 10·70077   | 2·75158 | 8·393  | 0·32 | 4·1282 | 0·7555 | 2·41 | 4·69 | 0·16 | 11·78 | 254 | 158·72 |
| 1973·0  | 66·95931   | 2·10337 | 11·219 | 1·09 | 5·1958 | 1·8598 | 6·05 | 2·34 | 0·12 | 26·68 | 219 | 67·05  |
| 1974·0  | 72·90021   | 0·45516 | 0·522  | 0·87 | 5·2635 | 1·9641 | 2·73 | 5·94 | 6·25 | 40·57 | 183 | 432·05 |
| 1975·0  | 78·84110   | 5·85788 | 2·347  | 0·64 | 5·3312 | 2·0685 | 6·37 | 2·59 | 5·21 | 4·31  | 147 | 339·37 |
| *1976·0 | 84·78200   | 4·20967 | 4·173  | 0·41 | 5·3988 | 2·1728 | 3·05 | 6·19 | 4·17 | 18·20 | 111 | 246·70 |
| 1977·0  | 141·04054  | 3·56146 | 6·999  | 1·20 | 6·4665 | 3·2771 | 0·74 | 3·84 | 4·13 | 33·10 | 76  | 155·02 |
| 1978·0  | 146·98144  | 1·91324 | 8·825  | 0·97 | 6·5341 | 3·3814 | 4·37 | 0·49 | 3·09 | 46·99 | 39  | 62·35  |
| 1979·0  | 152·92233  | 0·26503 | 10·651 | 0·75 | 6·6018 | 3·4857 | 1·06 | 4·09 | 2·05 | 10·73 | 3   | 427·35 |
| *1980·0 | 158·86323  | 5·66775 | 12·476 | 0·52 | 6·6694 | 3·5900 | 4·69 | 0·74 | 1·01 | 24·62 | 368 | 334·67 |
| 1981·0  | 215·12177  | 5·01954 | 2·779  | 1·30 | 0·5815 | 4·6943 | 2·38 | 5·34 | 0·97 | 39·52 | 333 | 243·00 |
| 1982·0  | 221·06267  | 3·37133 | 4·605  | 1·08 | 0·6492 | 4·7986 | 6·01 | 1·99 | 7·10 | 3·25  | 297 | 150·32 |
| 1983·0  | 227·00356  | 1·72312 | 6·431  | 0·85 | 0·7168 | 4·9029 | 2·70 | 5·59 | 6·06 | 17·15 | 261 | 57·65  |
| *1984·0 | 232·94446  | 0·07491 | 8·256  | 0·63 | 0·7845 | 5·0072 | 6·33 | 2·24 | 5·02 | 31·04 | 225 | 422·65 |
| 1985·0  | 289·20300  | 6·47762 | 11·082 | 1·41 | 1·8521 | 6·1115 | 4·02 | 6·84 | 4·98 | 45·93 | 189 | 330·97 |
| 1986·0  | 295·14390  | 4·82941 | 0·385  | 1·18 | 1·9198 | 6·2158 | 0·70 | 3·49 | 3·94 | 9·67  | 153 | 238·30 |
| 1987·0  | 301·08479  | 3·18120 | 2·211  | 0·96 | 1·9874 | 6·3202 | 4·34 | 0·13 | 2·90 | 23·57 | 117 | 145·62 |
| *1988·0 | 307·02569  | 1·53299 | 4·036  | 0·73 | 2·0551 | 6·4245 | 1·02 | 3·73 | 1·86 | 37·46 | 81  | 52·95  |
| 1989·0  | 3·28423    | 0·88478 | 6·862  | 1·51 | 3·1228 | 0·3739 | 5·66 | 1·38 | 1·82 | 2·20  | 46  | 418·95 |
| 1990·0  | 9·22513    | 6·28750 | 8·688  | 1·29 | 3·1904 | 0·4783 | 2·34 | 4·98 | 0·78 | 16·09 | 10  | 326·27 |
| 1991·0  | 15·16602   | 4·63929 | 10·514 | 1·06 | 3·2581 | 0·5826 | 5·98 | 1·63 | 6·91 | 29·98 | 375 | 233·60 |
| *1992·0 | 21·10692   | 2·99108 | 12·340 | 0·84 | 3·3257 | 0·6869 | 2·66 | 5·23 | 5·87 | 43·88 | 339 | 140·92 |
| 1993·0  | 77·36546   | 2·34287 | 2·642  | 1·61 | 4·3934 | 1·7912 | 0·35 | 2·88 | 5·83 | 8·61  | 303 | 49·25  |
| 1994·0  | 83·30636   | 0·69465 | 4·468  | 1·39 | 4·4610 | 1·8955 | 3·98 | 6·48 | 4·79 | 22·51 | 267 | 414·25 |
| 1995·0  | 89·24725   | 6·09737 | 6·294  | 1·17 | 4·5287 | 1·9998 | 0·67 | 3·13 | 3·75 | 36·40 | 231 | 321·58 |
| *1996·0 | 95·18815   | 4·44916 | 8·120  | 0·94 | 4·5963 | 2·1041 | 4·30 | 6·73 | 2·71 | 0·14  | 195 | 228·90 |
| 1997·0  | 151·44669  | 3·80095 | 10·945 | 1·72 | 5·6640 | 3·2084 | 1·99 | 4·38 | 2·67 | 15·03 | 160 | 137·23 |
| 1998·0  | 157·38759  | 2·15274 | 0·248  | 1·50 | 5·7316 | 3·3127 | 5·62 | 1·03 | 1·63 | 28·93 | 124 | 44·55  |
| 1999·0  | 163·32848  | 0·50453 | 2·074  | 1·27 | 5·7993 | 3·4170 | 2·31 | 4·63 | 0·59 | 42·82 | 87  | 409·55 |
| *2000·0 | 169·26939  | 5·90724 | 3·900  | 1·05 | 5·8669 | 3·5213 | 5·94 | 1·28 | 6·72 | 6·56  | 51  | 316·88 |
| Periods | ...        | 7·05093 | 12·523 | 7·16 | 7·1555 | 7·1548 | 6·95 | 6·95 | 7·18 | 50·16 | 401 | 457·67 |

Constant applied to entries in Column 2:  $-0^{\circ}.47000$ .

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XI continued Values at Epoch of Mean Longitude and the Arguments

| 4                     | 5      | 6        | 7              | 8                       | 9                   |       |      |        | 3    | 4     | 5                   |
|-----------------------|--------|----------|----------------|-------------------------|---------------------|-------|------|--------|------|-------|---------------------|
| L                     | M      | $\alpha$ | N              | O                       | P                   | Q     | R    | S      | T    | U     | V                   |
| <sup>d</sup><br>74 10 | 358 5  | 3646 0   | <b>1950 0</b>  | <sup>d</sup><br>0 63947 | <sup>d</sup><br>3 6 | 1 866 | 0 46 | 3 0919 | 5 87 | 0 71  | <sup>d</sup><br>0 6 |
| 439 10                | 37 66  | 4 11 3   | <b>1951 0</b>  | 0 757 7                 | 3 49                | 0 09  | 58   | 3 606  | 6 23 | 0 40  | 6 7                 |
| 3 1 80                | 117 7  | 44 0     | <b>1952 0</b>  | 87508                   | 0 15                | 2 15  | 0 71 | 3 4 93 | 6 58 | 0 533 | 5 6                 |
| 205 49                | 483 07 | 410 4    | <b>1953 0</b>  | 1 99 89                 | 1 39                | 3 95  | 1 83 | 4 5979 | 0 79 | 1 663 | 5 5                 |
| 88 19                 | 36 48  | 775 6    | <b>1954 0</b>  | 11070                   | 1 63                | 3 439 | 1 95 | 4 7666 | 1 14 | 1 794 | 4 4                 |
| 453 19                | 41 89  | 1140 7   | <b>1955 0</b>  | 850                     | 1 86                | 0 005 | 2 08 | 3 9352 | 1 50 | 1 925 | 3 3                 |
| 335 89                | 121 3  | 1505 6   | <b>*1956 0</b> | 2 34631                 | 2 10                | 0 148 | 20   | 5 1039 | 1 85 | 2 056 | 2                   |
| 219 59                | 171    | 1871 4   | <b>1957 0</b>  | 3 4641                  | 3 34                | 1 291 | 3 33 | 6 726  | 3 21 | 3 187 | 2 1                 |
| 102 29                | 366 71 | 2 36 0   | <b>1958 0</b>  | 3 58193                 | 0 00                | 1 435 | 3 45 | 6 4412 | 3 56 | 3 317 | 1 0                 |
| 467 9                 | 46 1   | 2600 8   | <b>1959 0</b>  | 3 69973                 | 0 23                | 1 578 | 0 00 | 6 6099 | 3 9  | 3 448 | 7 1                 |
| 349 98                | 1 5 53 | 965 8    | <b>1960 0</b>  | 3 81754                 | 0 47                | 1 721 | 0 12 | 6 7785 | 4 27 | 3 579 | 6 0                 |
| 33 68                 | 5 94   | 333 0    | <b>1961 0</b>  | 4 93535                 | 1 71                | 2 864 | 1 5  | 0 7936 | 5 63 | 4 710 | 5 9                 |
| 116 38                | 370 94 | 3697     | <b>1962 0</b>  | 5 5316                  | 1 94                | 3 007 | 1 37 | 0 96 3 | 5 98 | 4 841 | 4 8                 |
| 481 38                | 50 35  | 4062 3   | <b>1963 0</b>  | 5 17096                 | 18                  | 3 151 | 1 50 | 1 1310 | 6 34 | 4 971 | 3 7                 |
| 364 08                | 1 9 76 | 96 7     | <b>*1964 0</b> | 5 8877                  | 42                  | 3 94  | 1 6  | 1 2996 | 6 69 | 5 10  | 2 7                 |
| 247 78                | 10 17  | 460 5    | <b>1965 0</b>  | 6 40658                 | 0 08                | 0 860 | 2 74 | 2 4683 | 0 90 | 6 33  | 2 6                 |
| 130 48                | 375 17 | 8 5 3    | <b>1966 0</b>  | 6 5 439                 | 0 31                | 1 003 | 2 87 | 2 6369 | 1 5  | 6 364 | 1 5                 |
| 13 17                 | 54 59  | 1190 3   | <b>1967 0</b>  | 6 64219                 | 0 55                | 1 147 | 2 99 | 8056   | 1 61 | 6 495 | 0 4                 |
| 378 17                | 134 00 | 1555     | <b>1968 0</b>  | 6 76000                 | 0 79                | 1 90  | 3 1  | 2 9742 | 1 96 | 6 6 5 | 6 5                 |
| 61 87                 | 14 41  | 19 1 1   | <b>1969 0</b>  | 0 723 6                 | 2 02                | 433   | 0 66 | 4 14 9 | 3 32 | 0 602 | 6 4                 |
| 144 57                | 379 41 | 86 3     | <b>1970 0</b>  | 0 84106                 | 26                  | 576   | 0 79 | 4 3116 | 3 67 | 0 733 | 5 3                 |
| 27 7                  | 258 8  | 2651 5   | <b>1971 0</b>  | 0 95887                 | 2 49                | 2 720 | 0 91 | 4 4802 | 4 03 | 0 863 | 4 2                 |
| 39 7                  | 138 3  | 3016 6   | <b>*1972 0</b> | 1 07668                 | 73                  | 863   | 1 04 | 4 6489 | 4 38 | 0 994 | 3 1                 |
| 75 97                 | 18 64  | 3382 7   | <b>1973 0</b>  | 2 19449                 | 0 39                | 0 4 9 | 16   | 5 8175 | 5 74 | 2 1 5 | 3 0                 |
| 158 66                | 383 64 | 3747 5   | <b>1974 0</b>  | 31 9                    | 0 63                | 0 572 | 9    | 5 986  | 6 09 | 2 256 | 1 9                 |
| 41 36                 | 63 05  | 4112 2   | <b>1975 0</b>  | 43010                   | 0 86                | 715   | 2 41 | 6 1548 | 6 45 | 2 387 | 0 8                 |
| 406 36                | 142 46 | 144 4    | <b>*1976 0</b> | 54791                   | 1 10                | 0 859 | 53   | 6 3 35 | 6 80 | 2 517 | 6 9                 |
| 290 06                | 87     | 510 8    | <b>1977 0</b>  | 3 6657                  | 34                  | 2 00  | 0 08 | 0 3386 | 1 01 | 3 648 | 6 8                 |
| 17 76                 | 387 87 | 875 1    | <b>1978 0</b>  | 3 7835                  | 57                  | 145   | 0 1  | 0 5073 | 1 36 | 3 779 | 5 7                 |
| 55 46                 | 267 28 | 1 40 2   | <b>1979 0</b>  | 3 90133                 | 81                  | 88    | 0 33 | 0 6759 | 1 7  | 3 910 | 4 6                 |
| 420 46                | 146 69 | 1605 6   | <b>1980 0</b>  | 4 1914                  | 3 05                | 432   | 0 45 | 0 8446 | 07   | 4 041 | 3 5                 |
| 304 15                | 7 10   | 197 0    | <b>1981 0</b>  | 5 13695                 | 0 71                | 3 575 | 1 58 | 2 0132 | 3 43 | 5 171 | 3 4                 |
| 186 85                | 39 10  | 237 3    | <b>1982 0</b>  | 5 5475                  | 0 94                | 0 141 | 1 70 | 1819   | 3 79 | 5 30  | 3                   |
| 69 55                 | 71 51  | 70 2     | <b>1983 0</b>  | 5 37256                 | 1 18                | 0 284 | 1 83 | 2 3506 | 4 14 | 5 433 | 1 2                 |
| 434 55                | 150 9  | 3 66 6   | <b>*1984 0</b> | 5 49 37                 | 1 42                | 0 4 8 | 1 95 | 2 5192 | 4 49 | 5 564 | 0 1                 |
| 318 25                | 31 33  | 3431 9   | <b>1985 0</b>  | 6 6 818                 | 65                  | 1 571 | 3 08 | 3 6879 | 5 86 | 6 695 | 0 1                 |
| 2 0 95                | 396 33 | 3796 0   | <b>1986 0</b>  | 6 7 598                 | 2 89                | 1 714 | 3 20 | 3 8565 | 6 1  | 6 825 | 6 1                 |
| 83 64                 | 75 74  | 4160 3   | <b>1987 0</b>  | 6 84379                 | 3 13                | 1 857 | 3 3  | 4 0 5  | 6 56 | 6 956 | 5 0                 |
| 448 64                | 155 15 | 192 6    | <b>1988 0</b>  | 6 96160                 | 3 36                | 0 01  | 3 45 | 4 1939 | 6 92 | 7 087 | 4 0                 |
| 33 34                 | 35 56  | 558 8    | <b>1989 0</b>  | 0 92485                 | 1 0                 | 3 144 | 1 00 | 5 36 5 | 1 12 | 1 063 | 3 9                 |
| 15 04                 | 40 56  | 924 3    | <b>1990 0</b>  | 1 04266                 | 1 6                 | 3 87  | 1 12 | 5 531  | 1 48 | 1 194 | 2 8                 |
| 97 74                 | 79 97  | 1 9 1    | <b>1991 0</b>  | 1 16047                 | 1 5                 | 3 430 | 1 24 | 5 6998 | 1 83 | 1 3 5 | 1 7                 |
| 46 74                 | 159 38 | 1655 8   | <b>*1992 0</b> | 1 78 8                  | 1 73                | 3 573 | 1 37 | 5 8685 | 2 19 | 1 456 | 0 6                 |
| 346 44                | 39 79  | 20 3     | <b>1993 0</b>  | 39608                   | 97                  | 1 140 | 2 49 | 7 0372 | 3 54 | 2 587 | 0 5                 |
| 9 14                  | 4 4 79 | 387 4    | <b>1994 0</b>  | 51389                   | 3 1                 | 1 283 | 6    | 0 052  | 3 90 | 2 717 | 6 6                 |
| 111 83                | 284    | 275 1    | <b>1995 0</b>  | 2 63170                 | 3 44                | 1 4 6 | 2 74 | 0 2 09 | 4 25 | 848   | 5 5                 |
| 476 83                | 163 61 | 3116 4   | <b>*1996 0</b> | 2 74951                 | 0 10                | 1 569 | 87   | 0 3896 | 4 61 | 2 979 | 4 4                 |
| 360 53                | 44 02  | 3481 6   | <b>1997 0</b>  | 3 86731                 | 1 34                | 713   | 0 41 | 1 5582 | 5 96 | 4 110 | 4 3                 |
| 43 3                  | 409 02 | 3845 9   | <b>1998 0</b>  | 3 98512                 | 1 57                | 2 856 | 0 54 | 1 7 69 | 6 3  | 4 41  | 3                   |
| 125 93                | 88 43  | 4 10 5   | <b>1999 0</b>  | 4 10 93                 | 1 81                | 2 999 | 0 66 | 1 8955 | 6 67 | 4 371 | 2 1                 |
| 8 63                  | 167 84 | 4 9      | <b>*2000 0</b> | 4 074                   | 2 05                | 3 142 | 0 79 | 2 0642 | 7 03 | 4 502 | 1 0                 |
| 482 30                | 485 59 | 433 6    | Per ods        | 7 15455                 | 3 58                | 3 577 | 3 58 | 7 1536 | 7 15 | 7 154 | 7 2                 |

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# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### XII      Motions of Mean Longitude and the Arguments for Days

| 1           | 2          | 3       | 4      | 5    | 6      | 7      | 8    | 9    | 10   | 11    | 12          |
|-------------|------------|---------|--------|------|--------|--------|------|------|------|-------|-------------|
| Day         | Mean Long. | A       | B      | C    | D      | E      | F    | G    | H    | I     | J— $\alpha$ |
|             | °          | d       | d      | d    | d      | d      | d    | d    | d    | d     | d           |
| <b>Jan.</b> |            |         |        |      |        |        |      |      |      |       |             |
| 1           | 50°31765   | 1°00000 | 1°000  | 1°00 | 1°0000 | 1°0000 | 1°00 | 1°00 | 1°00 | 1°00  | 1°00        |
| 2           | 100°63529  | 2°00000 | 2°000  | 2°00 | 2°0000 | 2°0000 | 2°00 | 2°00 | 2°00 | 2°00  | 2°00        |
| 3           | 150°95294  | 3°00000 | 3°000  | 3°00 | 3°0000 | 3°0000 | 3°00 | 3°00 | 3°00 | 3°00  | 3°00        |
| 4           | 201°27059  | 4°00000 | 4°000  | 4°00 | 4°0000 | 4°0000 | 4°00 | 4°00 | 4°00 | 4°00  | 4°00        |
| 5           | 251°58823  | 5°00000 | 5°000  | 5°00 | 5°0000 | 5°0000 | 5°00 | 5°00 | 5°00 | 5°00  | 5°00        |
| 6           | 301°90588  | 6°00000 | 6°000  | 6°00 | 6°0000 | 6°0000 | 6°00 | 6°00 | 6°00 | 6°00  | 6°00        |
| 7           | 352°22352  | 7°00000 | 7°000  | 7°00 | 7°0000 | 7°0000 | 0°05 | 0°05 | 7°00 | 7°00  | 7°00        |
| 8           | 42°54117   | 0°94907 | 8°000  | 0°84 | 0°8445 | 0°8452 | 1°05 | 1°05 | 0°82 | 8°00  | 8°00        |
| 9           | 92°85882   | 1°94907 | 9°000  | 1°84 | 1°8445 | 1°8452 | 2°05 | 2°05 | 1°82 | 9°00  | 9°00        |
| 10          | 143°17646  | 2°94907 | 10°000 | 2°84 | 2°8445 | 2°8452 | 3°05 | 3°05 | 2°82 | 10°00 | 10°00       |
| 11          | 193°49411  | 3°94907 | 11°000 | 3°84 | 3°8445 | 3°8452 | 4°05 | 4°05 | 3°82 | 11°00 | 11°00       |
| 12          | 243°81176  | 4°94907 | 12°000 | 4°84 | 4°8445 | 4°8452 | 5°05 | 5°05 | 4°82 | 12°00 | 12°00       |
| 13          | 294°12940  | 5°94907 | 0°477  | 5°84 | 5°8445 | 5°8452 | 6°05 | 6°05 | 5°82 | 13°00 | 13°00       |
| 14          | 344°44705  | 6°94907 | 1°477  | 6°84 | 6°8445 | 6°8452 | 0°10 | 0°10 | 6°82 | 14°00 | 14°00       |
| 15          | 34°76469   | 0°89815 | 2°477  | 0°68 | 0°6889 | 0°6904 | 1°10 | 1°10 | 0°65 | 15°00 | 15°00       |
| 16          | 85°08234   | 1°89815 | 3°477  | 1°68 | 1°6889 | 1°6904 | 2°10 | 2°10 | 1°65 | 16°00 | 16°00       |
| 17          | 135°39999  | 2°89815 | 4°477  | 2°68 | 2°6889 | 2°6904 | 3°10 | 3°10 | 2°65 | 17°00 | 17°00       |
| 18          | 185°71763  | 3°89815 | 5°477  | 3°68 | 3°6889 | 3°6904 | 4°10 | 4°10 | 3°65 | 18°00 | 18°00       |
| 19          | 236°03528  | 4°89815 | 6°477  | 4°68 | 4°6889 | 4°6904 | 5°10 | 5°10 | 4°65 | 19°00 | 19°00       |
| 20          | 286°35293  | 5°89815 | 7°477  | 5°68 | 5°6889 | 5°6904 | 6°10 | 6°10 | 5°65 | 20°00 | 20°00       |
| 21          | 336°67057  | 6°89815 | 8°477  | 6°68 | 6°6889 | 6°6904 | 0°15 | 0°15 | 6°65 | 21°00 | 21°00       |
| 22          | 26°98822   | 0°84722 | 9°477  | 0°52 | 0°5334 | 0°5356 | 1°15 | 1°15 | 0°47 | 22°00 | 22°00       |
| 23          | 77°30586   | 1°84722 | 10°477 | 1°52 | 1°5334 | 1°5356 | 2°15 | 2°15 | 1°47 | 23°00 | 23°00       |
| 24          | 127°62351  | 2°84722 | 11°477 | 2°52 | 2°5334 | 2°5356 | 3°15 | 3°15 | 2°47 | 24°00 | 24°00       |
| 25          | 177°94116  | 3°84722 | 12°477 | 3°52 | 3°5334 | 3°5356 | 4°15 | 4°15 | 3°47 | 25°00 | 25°00       |
| 26          | 228°25880  | 4°84722 | 0°954  | 4°52 | 4°5334 | 4°5356 | 5°15 | 5°15 | 4°47 | 26°00 | 26°00       |
| 27          | 278°57645  | 5°84722 | 1°954  | 5°52 | 5°5334 | 5°5356 | 6°15 | 6°15 | 5°47 | 27°00 | 27°00       |
| 28          | 328°89410  | 6°84722 | 2°954  | 6°52 | 6°5334 | 6°5356 | 0°20 | 0°20 | 6°47 | 28°00 | 28°00       |
| 29          | 19°21174   | 0°79629 | 3°954  | 0°35 | 0°3779 | 0°3807 | 1°20 | 1°20 | 0°29 | 29°00 | 29°00       |
| 30          | 69°52939   | 1°79629 | 4°954  | 1°35 | 1°3779 | 1°3807 | 2°20 | 2°20 | 1°29 | 30°00 | 30°00       |
| <b>Feb.</b> |            |         |        |      |        |        |      |      |      |       |             |
| 31          | 119°84703  | 2°79629 | 5°954  | 2°35 | 2°3779 | 2°3807 | 3°20 | 3°20 | 2°29 | 31°00 | 31°00       |
| 1           | 170°16468  | 3°79629 | 6°954  | 3°35 | 3°3779 | 3°3807 | 4°20 | 4°20 | 3°29 | 32°00 | 32°00       |
| 2           | 220°48233  | 4°79629 | 7°954  | 4°35 | 4°3779 | 4°3807 | 5°20 | 5°20 | 4°29 | 33°00 | 33°00       |
| 3           | 270°79997  | 5°79629 | 8°954  | 5°35 | 5°3779 | 5°3807 | 6°20 | 6°20 | 5°29 | 34°00 | 34°00       |
| 4           | 321°11762  | 6°79629 | 9°954  | 6°35 | 6°3779 | 6°3807 | 0°25 | 0°25 | 6°29 | 35°00 | 35°00       |
| 5           | 11°43527   | 0°74536 | 10°954 | 0°19 | 0°2223 | 0°2259 | 1°25 | 1°25 | 0°11 | 36°00 | 36°00       |
| 6           | 61°75291   | 1°74536 | 11°954 | 1°19 | 1°2223 | 1°2259 | 2°25 | 2°25 | 1°11 | 37°00 | 37°00       |
| 7           | 112°07056  | 2°74536 | 0°430  | 2°19 | 2°2223 | 2°2259 | 3°25 | 3°25 | 2°11 | 38°00 | 38°00       |
| 8           | 162°38821  | 3°74536 | 1°430  | 3°19 | 3°2223 | 3°2259 | 4°25 | 4°25 | 3°11 | 39°00 | 39°00       |
| 9           | 212°70585  | 4°74536 | 2°430  | 4°19 | 4°2223 | 4°2259 | 5°25 | 5°25 | 4°11 | 40°00 | 40°00       |
| 10          | 263°02350  | 5°74536 | 3°430  | 5°19 | 5°2223 | 5°2259 | 6°25 | 6°25 | 5°11 | 41°00 | 41°00       |
| 11          | 313°34114  | 6°74536 | 4°430  | 6°19 | 6°2223 | 6°2259 | 0°30 | 0°30 | 6°11 | 42°00 | 42°00       |
| 12          | 3°65879    | 0°69444 | 5°430  | 0°03 | 0°0668 | 0°0711 | 1°30 | 1°30 | 7°11 | 43°00 | 43°00       |
| 13          | 53°97644   | 1°69444 | 6°430  | 1°03 | 1°0668 | 1°0711 | 2°30 | 2°30 | 0°94 | 44°00 | 44°00       |
| 14          | 104°29408  | 2°69444 | 7°430  | 2°03 | 2°0668 | 2°0711 | 3°30 | 3°30 | 1°94 | 45°00 | 45°00       |
| 15          | 154°61173  | 3°69444 | 8°430  | 3°03 | 3°0668 | 3°0711 | 4°30 | 4°30 | 2°94 | 46°00 | 46°00       |
| 16          | 204°92938  | 4°69444 | 9°430  | 4°03 | 4°0668 | 4°0711 | 5°30 | 5°30 | 3°94 | 47°00 | 47°00       |
| 17          | 255°24702  | 5°69444 | 10°430 | 5°03 | 5°0668 | 5°0711 | 6°30 | 6°30 | 4°94 | 48°00 | 48°00       |
| 18          | 305°56467  | 6°69444 | 11°430 | 6°03 | 6°0668 | 6°0711 | 0°35 | 0°35 | 5°94 | 49°00 | 49°00       |
| 19          | 355°88231  | 0°64351 | 12°430 | 7°03 | 7°0668 | 7°0711 | 1°35 | 1°35 | 6°94 | 50°00 | 50°00       |
| 20          | 46°19996   | 1°64351 | 0°907  | 0°87 | 0°9112 | 0°9163 | 2°35 | 2°35 | 0°76 | 0°84  | 51°00       |
| 21          | 96°51761   | 2°64351 | 1°907  | 1°87 | 1°9112 | 1°9163 | 3°35 | 3°35 | 1°76 | 1°84  | 52°00       |
| 22          | 146°83525  | 3°64351 | 2°907  | 2°87 | 2°9112 | 2°9163 | 4°35 | 4°35 | 2°76 | 2°84  | 53°00       |

In Leap Year diminish the date in Columns 1, 13, by 1 day after Feb. 28.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### XII      Motions of Mean Longitude and the Arguments for Days

| 3            | 4   | 5       | 6    | 7      | 8     | 9      |      |       |     |
|--------------|-----|---------|------|--------|-------|--------|------|-------|-----|
| Day          | N   | O       | P    | Q      | R     | S      | T    | U     | V   |
|              |     |         |      | d      | d     |        |      | d     | d   |
| <b>Jan</b> 1 | o   | I 00    | I o  | I 000  | I 00  | I 00 o | I 00 | I 000 | I o |
| 2            | o   | 0000    | 00   | 000    | o     | 0000   | 2 o  | 000   | o   |
| 3            | o   | 3 o     | 3 00 | 3 o o  | 3 o   | 3 000  | 3 00 | 3 00  | 3 o |
| 4            | oo  | 4 000   | 42   | o 423  | o 4   | 4 o    | 4 00 | 4 o o | 4 o |
| 5            | o   | 5 00 o  | I 4  | I 4 3  | I 42  | 5 0000 | 5 00 | 5 o   | 5 o |
| 6            | oo  | 6 0000  | 4    | 4 3    | 42    | 6 000  | 6 00 | 6 000 | 6   |
| 7            | oo  | 7 0000  | 3 4  | 3 4 3  | 3 4   | 7 000  | 7 o  | 7 00  | 7 o |
| 8            | oo  | o 84545 | o 85 | o 846  | o 85  | o 8464 | o 85 | o 846 | o 8 |
| 9            | oo  | I 84545 | I 85 | I 846  | I 85  | I 8464 | I 85 | I 846 | I 8 |
| 10           | oo  | 2 84545 | 85   | 846    | 2 85  | 2 8464 | 85   | 2 846 | 2 8 |
| 11           | oo  | 3 84545 | o 7  | o 269  | o 27  | 3 8464 | 3 85 | 3 846 | 3 8 |
| 12           | oo  | 4 84545 | I 7  | I 69   | I 27  | 4 8464 | 4 85 | 4 846 | 4 8 |
| 13           | oo  | 5 84545 | 7    | 69     | 2 27  | 5 8464 | 5 85 | 5 846 | 5 8 |
| 14           | o   | 6 84545 | 3 27 | 3 69   | 3 7   | 6 8464 | 6 85 | 6 846 | 6 8 |
| 15           | o   | 69089   | 70   | 69     | o 69  | o 6929 | o 70 | o 691 | o 6 |
| 16           | o   | I 69089 | I 70 | I 692  | I (9  | I 6) 9 | I 70 | I 691 | I 6 |
| 17           | o   | 69 89   | 70   | 69     | 6)    | 692)   | 70   | 2 691 | 2 6 |
| 18           | oo  | 3 69089 | o I  | o I I5 | o I I | 3 (9 9 | 3 70 | 3 691 | 3 6 |
| 19           | I   | 4 69089 | I I  | I I I5 | I I I | 4 69 9 | 4 70 | 4 691 | 4 6 |
| 20           | I   | 5 69089 | I    | 2 I I5 | 2 I I | 5 69 9 | 5 70 | 5 691 | 5 6 |
| 21           | o I | 6 69089 | 3 I  | 3 I I5 | 3 I I | 6 6929 | 6 70 | 6 691 | 6 6 |
| 22           | o I | o 53634 | o 54 | o 538  | 54    | o 5393 | o 55 | o 537 | o 5 |
| 23           | I   | I 53634 | I 54 | I 538  | I 54  | I 5393 | I 55 | I 537 | I 5 |
| 24           | o I | 53634   | 54   | 538    | 2 54  | 5393   | 2 55 | 537   | 2 5 |
| 25           | o I | 3 53634 | 3 54 | 3 538  | 3 54  | 3 5393 | 3 55 | 3 537 | 3 5 |
| 26           | o I | 4 53634 | 97   | o 961  | o 96  | 4 5393 | 4 55 | 4 537 | 4 5 |
| 27           | o I | 5 53634 | I 97 | I 961  | I 96  | 5 5393 | 5 55 | 5 537 | 5 5 |
| 28           | o I | 6 53634 | 2 97 | 2 961  | 96    | 6 5393 | 6 55 | 6 537 | 6 5 |
| 29           | o I | o 38179 | o 39 | o 384  | o 38  | o 3858 | 40   | o 383 | o 3 |
| 30           | o I | I 38179 | I 39 | I 384  | I 38  | I 3858 | I 40 | I 383 | I 3 |
| 31           | I   | 2 38179 | 39   | 2 384  | 38    | 2 3858 | 2 40 | 2 383 | 2 3 |
| <b>Feb</b> 1 | o I | 3 38179 | 3 39 | 3 384  | 3 38  | 3 3858 | 3 40 | 3 383 | 3 3 |
| 2            | I   | 4 38 79 | o 81 | o 8 7  | o 81  | 4 3858 | 4 40 | 4 383 | 4 3 |
| 3            | o I | 5 38179 | I 81 | I 807  | I 81  | 5 3858 | 5 40 | 5 383 | 5 3 |
| 4            | o I | 6 38179 | 2 81 | 807    | 81    | 6 3858 | 6 40 | 6 383 | 6 3 |
| 5            | o I | o 7 4   | o 4  | o 30   | o 3   | o 32   | o 25 | o 229 | o I |
| 6            | o I | I 2 7 4 | I 24 | I 30   | I 3   | I 23 2 | I 25 | I 29  | I I |
| 7            | o I | 7 4     | 4    | 230    | 23    | 3      | 2 5  | 2 29  | 2 I |
| 8            | o I | 3 7 4   | 3 4  | 3 30   | 3 3   | 3 23   | 3 5  | 3 2 9 | 3 I |
| 9            | o I | 4 7 4   | o 66 | o 653  | o 65  | 4 322  | 4 25 | 4 2 9 | 4 I |
| 10           | o I | 5 27 4  | I 66 | I 653  | I 65  | 5 322  | 5 25 | 5 229 | 5 I |
| 11           | o I | 6 7 4   | 66   | 653    | 65    | 6 3    | 6 5  | 6 29  | 6 I |
| 12           | I   | o 7 68  | 09   | o 076  | o 07  | o 0787 | o 10 | o 074 | 7 I |
| 13           | o I | I 7 68  | I 09 | I 076  | I 07  | I 0787 | I 10 | I 074 | 09  |
| 14           | o I | o 7268  | 2 09 | o 76   | 2 07  | o 787  | 2 I  | 2 074 | I 9 |
| 15           | o I | 3 68    | 3 9  | 3 076  | 3 07  | 3 787  | 3 10 | 3 074 | 2 9 |
| 16           | o I | 4 7 68  | o 51 | o 499  | o 50  | 4 787  | 4 10 | 4 074 | 3 9 |
| 17           | I   | 5 07 68 | I 51 | I 499  | I 50  | 5 0787 | 5 10 | 5 074 | 4 9 |
| 18           | o I | 6 07 68 | 51   | 2 499  | 50    | 6 0787 | 6 I  | 6 74  | 5 9 |
| 19           | I   | 7 07 68 | 3 51 | 3 499  | 3 50  | 7 787  | 7 10 | 7 074 | 6 9 |
| 20           | o I | 91813   | o 93 | o 9 2  | o 92  | 9 51   | 95   | o 920 | o 8 |
| 21           | I   | I 91813 | I 93 | I 9 2  | I 92  | I 9 51 | I 95 | I 920 | I 8 |
| 22           | o I | 91813   | 93   | 9      | 2 92  | 2 9 51 | 95   | 2 920 | 2 8 |

I L p Y    d i m i n i   h t h   d t e i   C I m       3   b y   d y a t t   F b 8



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued      Motions of Mean Longitude and the Arguments for Days

| 1              | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           | 12           |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day            | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | I            | J— $\alpha$  |
|                | <sup>c</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>Feb. 23</b> | 197°15290    | 4°64351      | 3°907        | 3°87         | 3°9112       | 3°9163       | 5°35         | 5°35         | 3°76         | 3°84         | 54°00        |
| <b>24</b>      | 247°47055    | 5°64351      | 4°907        | 4°87         | 4°9112       | 4°9163       | 6°35         | 6°35         | 4°76         | 4°84         | 55°00        |
| <b>25</b>      | 297°78819    | 6°64351      | 5°907        | 5°87         | 5°9112       | 5°9163       | 0°41         | 0°40         | 5°76         | 5°84         | 56°00        |
| <b>26</b>      | 348°10584    | 0°59258      | 6°907        | 6°87         | 6°9112       | 6°9163       | 1°41         | 1°40         | 6°76         | 6°84         | 57°00        |
| <b>27</b>      | 38°42348     | 1°59258      | 7°907        | 0°71         | 0°7557       | 0°7615       | 2°41         | 2°40         | 0°58         | 7°84         | 58°00        |
| <b>28</b>      | 88°74113     | 2°59258      | 8°907        | 1°71         | 1°7557       | 1°7615       | 3°41         | 3°40         | 1°58         | 8°84         | 59°00        |
| <b>Mar. 1</b>  | 139°05878    | 3°59258      | 9°907        | 2°71         | 2°7557       | 2°7615       | 4°41         | 4°40         | 2°58         | 9°84         | 60°00        |
| <b>2</b>       | 189°37642    | 4°59258      | 10°907       | 3°71         | 3°7557       | 3°7615       | 5°41         | 5°40         | 3°58         | 10°84        | 61°00        |
| <b>3</b>       | 239°69407    | 5°59258      | 11°907       | 4°71         | 4°7557       | 4°7615       | 6°41         | 6°40         | 4°58         | 11°84        | 62°00        |
| <b>4</b>       | 290°01172    | 6°59258      | 0°384        | 5°71         | 5°7557       | 5°7615       | 0°46         | 0°45         | 5°58         | 12°84        | 63°00        |
| <b>5</b>       | 340°32936    | 0°54166      | 1°384        | 6°71         | 6°7557       | 6°7615       | 1°46         | 1°45         | 6°58         | 13°84        | 64°00        |
| <b>6</b>       | 30°64701     | 1°54166      | 2°384        | 0°55         | 0°6002       | 0°6066       | 2°46         | 2°45         | 0°41         | 14°84        | 65°00        |
| <b>7</b>       | 80°96466     | 2°54166      | 3°384        | 1°55         | 1°6002       | 1°6066       | 3°46         | 3°45         | 1°41         | 15°84        | 66°00        |
| <b>8</b>       | 131°28230    | 3°54166      | 4°384        | 2°55         | 2°6022       | 2°6066       | 4°46         | 4°45         | 2°41         | 16°84        | 67°00        |
| <b>9</b>       | 181°59995    | 4°54166      | 5°384        | 3°55         | 3°6002       | 3°6066       | 5°46         | 5°45         | 3°41         | 17°84        | 68°00        |
| <b>10</b>      | 231°91759    | 5°54166      | 6°384        | 4°55         | 4°6002       | 4°6066       | 6°46         | 6°45         | 4°41         | 18°84        | 69°00        |
| <b>11</b>      | 282°23524    | 6°54166      | 7°384        | 5°55         | 5°6002       | 5°6066       | 0°51         | 0°50         | 5°41         | 19°84        | 70°00        |
| <b>12</b>      | 332°55289    | 0°49073      | 8°384        | 6°55         | 6°6002       | 6°6066       | 1°51         | 1°50         | 6°41         | 20°84        | 71°00        |
| <b>13</b>      | 22°87053     | 1°49073      | 9°384        | 0°39         | 0°4446       | 0°4518       | 2°51         | 2°50         | 0°23         | 21°84        | 72°00        |
| <b>14</b>      | 73°18818     | 2°49073      | 10°384       | 1°39         | 1°4446       | 1°4518       | 3°51         | 3°50         | 1°23         | 22°84        | 73°00        |
| <b>15</b>      | 123°50583    | 3°49073      | 11°384       | 2°39         | 2°4446       | 2°4518       | 4°51         | 4°50         | 2°23         | 23°84        | 74°00        |
| <b>16</b>      | 173°82347    | 4°49073      | 12°384       | 3°39         | 3°4446       | 3°4518       | 5°51         | 5°50         | 3°23         | 24°84        | 75°00        |
| <b>17</b>      | 224°14112    | 5°49073      | 0°861        | 4°39         | 4°4446       | 4°4518       | 6°51         | 6°50         | 4°23         | 25°84        | 76°00        |
| <b>18</b>      | 274°45876    | 6°49073      | 1°861        | 5°39         | 5°4446       | 5°4518       | 0°56         | 0°55         | 5°23         | 26°84        | 77°00        |
| <b>19</b>      | 324°77641    | 0°43980      | 2°861        | 6°39         | 6°4446       | 6°4518       | 1°56         | 1°55         | 6°23         | 27°84        | 78°00        |
| <b>20</b>      | 15°09406     | 1°43980      | 3°861        | 0°23         | 0°2891       | 0°2970       | 2°56         | 2°55         | 0°05         | 28°84        | 79°00        |
| <b>21</b>      | 65°41170     | 2°43980      | 4°861        | 1°23         | 1°2891       | 1°2970       | 3°56         | 3°55         | 1°05         | 29°84        | 80°00        |
| <b>22</b>      | 115°72935    | 3°43980      | 5°861        | 2°23         | 2°2891       | 2°2970       | 4°56         | 4°55         | 2°05         | 30°84        | 81°00        |
| <b>23</b>      | 166°04700    | 4°43980      | 6°861        | 3°23         | 3°2891       | 3°2970       | 5°56         | 5°55         | 3°05         | 31°84        | 82°00        |
| <b>24</b>      | 216°36464    | 5°43980      | 7°861        | 4°23         | 4°2891       | 4°2970       | 6°56         | 6°55         | 4°05         | 32°84        | 83°00        |
| <b>25</b>      | 266°68229    | 6°43980      | 8°861        | 5°23         | 5°2891       | 5°2970       | 0°61         | 0°60         | 5°05         | 33°84        | 84°00        |
| <b>26</b>      | 316°99993    | 0°38887      | 9°861        | 6°23         | 6°2891       | 6°2970       | 1°61         | 1°60         | 6°05         | 34°84        | 85°00        |
| <b>27</b>      | 7°31758      | 1°38887      | 10°861       | 0°06         | 0°1336       | 0°1422       | 2°61         | 2°60         | 7°05         | 35°84        | 86°00        |
| <b>28</b>      | 57°63523     | 2°38887      | 11°861       | 1°06         | 1°1336       | 1°1422       | 3°61         | 3°60         | 0°87         | 36°84        | 87°00        |
| <b>29</b>      | 107°95287    | 3°38887      | 0°337        | 2°06         | 2°1336       | 2°1422       | 4°61         | 4°60         | 1°87         | 37°84        | 88°00        |
| <b>30</b>      | 158°27052    | 4°38887      | 1°337        | 3°06         | 3°1336       | 3°1422       | 5°61         | 5°60         | 2°87         | 38°84        | 89°00        |
| <b>31</b>      | 208°58817    | 5°38887      | 2°337        | 4°06         | 4°1336       | 4°1422       | 6°61         | 6°60         | 3°87         | 39°84        | 90°00        |
| <b>April 1</b> | 258°90581    | 6°38887      | 3°337        | 5°06         | 5°1336       | 5°1422       | 0°66         | 0°65         | 4°87         | 40°84        | 91°00        |
| <b>2</b>       | 309°22346    | 0°33795      | 4°337        | 6°06         | 6°1336       | 6°1422       | 1°66         | 1°65         | 5°87         | 41°84        | 92°00        |
| <b>3</b>       | 359°54110    | 1°33795      | 5°337        | 7°06         | 7°1336       | 7°1422       | 2°66         | 2°65         | 6°87         | 42°84        | 93°00        |
| <b>4</b>       | 49°85875     | 2°33795      | 6°337        | 0°90         | 0°9780       | 0°9874       | 3°66         | 3°65         | 0°70         | 43°84        | 94°00        |
| <b>5</b>       | 100°17640    | 3°33795      | 7°337        | 1°90         | 1°9780       | 1°9874       | 4°66         | 4°65         | 1°70         | 44°84        | 95°00        |
| <b>6</b>       | 150°49404    | 4°33795      | 8°337        | 2°90         | 2°9780       | 2°9874       | 5°66         | 5°65         | 2°70         | 45°84        | 96°00        |
| <b>7</b>       | 200°81169    | 5°33795      | 9°337        | 3°90         | 3°9780       | 3°9874       | 6°66         | 6°65         | 3°70         | 46°84        | 97°00        |
| <b>8</b>       | 251°12934    | 6°33795      | 10°337       | 4°90         | 4°9780       | 4°9874       | 0°71         | 0°70         | 4°70         | 47°84        | 98°00        |
| <b>9</b>       | 301°44698    | 0°28702      | 11°337       | 5°90         | 5°9780       | 5°9874       | 1°71         | 1°70         | 5°70         | 48°84        | 99°00        |
| <b>10</b>      | 351°76463    | 1°28702      | 12°337       | 6°90         | 6°9780       | 6°9874       | 2°71         | 2°70         | 6°70         | 49°84        | 100°00       |
| <b>11</b>      | 42°08228     | 2°28702      | 0°814        | 0°74         | 0°8225       | 0°8326       | 3°71         | 3°70         | 0°52         | 0°68         | 101°00       |
| <b>12</b>      | 92°39992     | 3°28702      | 1°814        | 1°74         | 1°8225       | 1°8326       | 4°71         | 4°70         | 1°52         | 1°68         | 102°00       |
| <b>13</b>      | 142°71757    | 4°28702      | 2°814        | 2°74         | 2°8225       | 2°8326       | 5°71         | 5°70         | 2°52         | 2°68         | 103°00       |
| <b>14</b>      | 193°03521    | 5°28702      | 3°814        | 3°74         | 3°8225       | 3°8326       | 6°71         | 6°70         | 3°52         | 3°68         | 104°00       |
| <b>15</b>      | 243°35286    | 6°28702      | 4°814        | 4°74         | 4°8225       | 4°8326       | 0°76         | 0°75         | 4°52         | 4°68         | 105°00       |
| <b>16</b>      | 293°67051    | 0°23609      | 5°814        | 5°74         | 5°8225       | 5°8326       | 1°76         | 1°75         | 5°52         | 5°68         | 106°00       |

In Leap Year diminish the date in Columns 1, 13, by 1 day after Feb. 28.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued Motions of Mean Longitude and the Arguments for Days

| 3              | 4   | 5       | 6    | 7     | 8    | 9      |      |       |     |
|----------------|-----|---------|------|-------|------|--------|------|-------|-----|
| Day            | N   | O       | P    | Q     | R    | S      | T    | U     | V   |
| <b>Feb 23</b>  | 0 1 | 3 91813 | 0 36 | 345   | 0 34 | 3 9 51 | 3 95 | 3 920 | 3 8 |
| <b>24</b>      | 2   | 4 91813 | 1 36 | 1 345 | 1 34 | 4 9 51 | 4 95 | 4 9 0 | 4 8 |
| <b>25</b>      | 0   | 5 91813 | 2 36 | 2 345 | 2 34 | 5 9 51 | 5 95 | 5 920 | 5 8 |
| <b>26</b>      | 2   | 6 91813 | 3 36 | 3 345 | 3 34 | 6 9251 | 6 95 | 6 920 | 6 8 |
| <b>27</b>      | 0 2 | 0 76358 | 0 78 | 0 768 | 0 76 | 7716   | 0 80 | 0 766 | 0 6 |
| <b>28</b>      | 2   | 1 76358 | 1 78 | 1 768 | 1 76 | 1 7716 | 1 80 | 1 766 | 1 6 |
| <b>Mar 1</b>   |     | 76358   | 78   | 2 768 | 76   | 7716   | 80   | 2 766 | 6   |
| <b>2</b>       | 0   | 3 76358 | 0 21 | 0 191 | 0 19 | 3 7716 | 3 8  | 3 766 | 3 6 |
| <b>3</b>       | 0   | 4 76358 | 1 1  | 1 191 | 1 19 | 4 7716 | 4 80 | 4 766 | 4 6 |
| <b>4</b>       | 0 2 | 5 76358 | 2 1  | 2 191 | 2 19 | 5 7716 | 5 80 | 5 766 | 5 6 |
| <b>5</b>       | 0 2 | 6 76358 | 3 21 | 3 191 | 3 19 | 6 7716 | 6 80 | 6 766 | 6 6 |
| <b>6</b>       | 0   | 6 90    | 0 63 | 0 614 | 0 61 | 0 6180 | 0 65 | 6 11  | 0 4 |
| <b>7</b>       | 0   | 1 609   | 1 63 | 1 614 | 1 61 | 1 6180 | 1 65 | 1 611 | 1 4 |
| <b>8</b>       | 0 2 | 6090    | 63   | 2 614 | 2 61 | 2 6180 | 65   | 2 611 | 2 4 |
| <b>9</b>       | 0   | 3 6 9   | 0 05 | 0 036 | 0 03 | 3 6180 | 3 65 | 3 611 | 3 4 |
| <b>10</b>      | 0   | 4 60902 | 1 05 | 1 036 | 1 03 | 4 6180 | 4 65 | 4 611 | 4 4 |
| <b>11</b>      | 0 2 | 5 6 90  | 2 5  | 036   | 2 03 | 5 6180 | 5 65 | 5 611 | 5 4 |
| <b>12</b>      | 0   | 6 60902 | 3 05 | 3 036 | 3 03 | 6 6180 | 6 65 | 6 611 | 6 4 |
| <b>13</b>      | 0   | 0 45447 | 0 48 | 0 459 | 0 46 | 0 4644 | 0 50 | 0 457 | 0 2 |
| <b>14</b>      | 2   | 1 45447 | 1 48 | 1 459 | 1 46 | 1 4644 | 1 50 | 1 457 | 1 2 |
| <b>15</b>      | 0   | 2 45447 | 2 48 | 459   | 2 46 | 2 4644 | 2 50 | 2 457 | 2 2 |
| <b>16</b>      | 0   | 3 45447 | 3 48 | 3 459 | 3 46 | 3 4644 | 3 50 | 3 457 | 3 2 |
| <b>17</b>      | 0   | 4 45447 | 0 90 | 0 882 | 0 88 | 4 4644 | 4 50 | 4 457 | 4   |
| <b>18</b>      | 0 2 | 5 45447 | 1 90 | 1 88  | 1 88 | 5 4644 | 5 50 | 5 457 | 5 2 |
| <b>19</b>      | 0 2 | 6 45447 | 2 90 | 2 88  | 88   | 6 4644 | 6 50 | 6 457 | 6 2 |
| <b>20</b>      | 2   | 0 999   | 0 33 | 0 305 | 0 30 | 0 3109 | 0 35 | 0 303 | 0 0 |
| <b>21</b>      | 0 2 | 1 9992  | 1 33 | 1 305 | 1 30 | 1 3109 | 1 35 | 1 3 3 | 1 0 |
| <b>22</b>      | 0   | 9992    | 33   | 305   | 2 30 | 3109   | 35   | 303   | 2 0 |
| <b>23</b>      | 0 2 | 3 999   | 3 33 | 3 305 | 3 30 | 3 3109 | 3 35 | 3 303 | 3 0 |
| <b>24</b>      | 0   | 4 2999  | 0 75 | 0 7 8 | 0 7  | 4 3109 | 4 35 | 4 303 | 4 0 |
| <b>25</b>      | 0 2 | 5 2999  | 1 75 | 1 7 8 | 1 72 | 5 3109 | 5 35 | 5 3 3 | 5 0 |
| <b>26</b>      | 0   | 6 9992  | 2 75 | 2 7 8 | 7    | 6 3109 | 6 35 | 6 303 | 6 0 |
| <b>27</b>      | 0 2 | 0 14537 | 0 17 | 0 151 | 0 15 | 0 1573 | 0 20 | 0 148 | 7 0 |
| <b>28</b>      | 0   | 1 14537 | 1 17 | 1 151 | 1 15 | 1 1573 | 1 20 | 1 148 | 0 9 |
| <b>29</b>      | 0 2 | 2 14537 | 17   | 2 151 | 2 15 | 2 1573 | 2 20 | 2 148 | 1 9 |
| <b>30</b>      | 0   | 3 14537 | 3 17 | 3 151 | 3 15 | 3 1573 | 3 20 | 3 148 | 2 9 |
| <b>31</b>      | 0   | 4 14537 | 0 60 | 0 574 | 0 57 | 4 1573 | 4 0  | 4 148 | 3 9 |
| <b>April 1</b> | 0   | 5 14537 | 1 60 | 1 574 | 1 57 | 5 1573 | 5 20 | 5 148 | 4 9 |
| <b>2</b>       | 3   | 6 14537 | 6    | 2 574 | 2 57 | 6 1573 | 6 20 | 6 148 | 5 9 |
| <b>3</b>       | 3   | 7 14537 | 0    | 3 574 | 3 57 | 0 0 38 | 05   | 7 148 | 6 9 |
| <b>4</b>       | 0 3 | 0 99081 | 1    | 0 997 | 0 99 | 1 0 38 | 1 05 | 994   | 7   |
| <b>5</b>       | 0 3 | 1 99081 | 02   | 1 997 | 1 99 | 0 38   | 2 05 | 1 994 | 1 7 |
| <b>6</b>       | 0 3 | 2 99 81 | 3 0  | 2 997 | 2 99 | 3 0038 | 3 05 | 2 994 | 2 7 |
| <b>7</b>       | 0 3 | 3 99081 | 44   | 0 4 0 | 0 4  | 4 038  | 4 5  | 3 994 | 3 7 |
| <b>8</b>       | 0 3 | 4 99081 | 1 44 | 1 42  | 1 42 | 5 0038 | 5 05 | 4 994 | 4 7 |
| <b>9</b>       | 0 3 | 5 99 81 | 44   | 2 4 0 | 2 42 | 6 038  | 6 05 | 5 994 | 5 7 |
| <b>10</b>      | 0 3 | 6 99081 | 3 44 | 3 420 | 3 42 | 7 038  | 7 05 | 6 994 | 6 7 |
| <b>11</b>      | 0 3 | 0 83626 | 0 87 | 0 843 | 0 84 | 0 8502 | 0 90 | 0 840 | 0 5 |
| <b>12</b>      | 0 3 | 1 836 6 | 1 87 | 1 843 | 1 84 | 1 8502 | 1 90 | 1 84  | 1 5 |
| <b>13</b>      | 0 3 | 2 836 6 | 87   | 2 843 | 2 84 | 850    | 90   | 2 840 | 5   |
| <b>14</b>      | 0 3 | 3 836 6 | 0 29 | 0 66  | 0 26 | 3 850  | 3 90 | 3 840 | 3 5 |
| <b>15</b>      | 0 3 | 4 83626 | 1 9  | 1 266 | 1 26 | 4 850  | 4 9  | 4 840 | 4 5 |
| <b>16</b>      | 0 3 | 5 83626 | 2 9  | 266   | 6    | 5 850  | 5 90 | 5 84  | 5 5 |

I L p Y dim i n t l d t i O l m 3 by d y f t F b 8

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued Motions of Mean Longitude and the Arguments for Days

| 1               | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           | 12           |
|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day             | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | I            | J— $\alpha$  |
|                 | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>April 17</b> | 343°98815    | 1°23609      | 6°814        | 6°74         | 6°8225       | 6°8326       | 2°76         | 2°75         | 6°52         | 6°68         | 107°00       |
| <b>18</b>       | 34°30580     | 2°23609      | 7°814        | 0°58         | 0°6670       | 0°6777       | 3°76         | 3°75         | 0°34         | 7°68         | 108°00       |
| <b>19</b>       | 84°62345     | 3°23609      | 8°814        | 1°58         | 1°6670       | 1°6777       | 4°76         | 4°75         | 1°34         | 8°68         | 109°00       |
| <b>20</b>       | 134°94109    | 4°23609      | 9°814        | 2°58         | 2°6670       | 2°6777       | 5°76         | 5°75         | 2°34         | 9°68         | 110°00       |
| <b>21</b>       | 185°25874    | 5°23609      | 10°814       | 3°58         | 3°6670       | 3°6777       | 6°76         | 6°75         | 3°34         | 10°68        | 111°00       |
| <b>22</b>       | 235°57638    | 6°23609      | 11°814       | 4°58         | 4°6670       | 4°6777       | 0°81         | 0°80         | 4°34         | 11°68        | 112°00       |
| <b>23</b>       | 285°89403    | 0°18517      | 0°291        | 5°58         | 5°6670       | 5°6777       | 1°81         | 1°80         | 5°34         | 12°68        | 113°00       |
| <b>24</b>       | 336°21168    | 1°18517      | 1°291        | 6°58         | 6°6670       | 6°6777       | 2°81         | 2°80         | 6°34         | 13°68        | 114°00       |
| <b>25</b>       | 26°52932     | 2°18517      | 2°291        | 0°42         | 0°5114       | 0°5229       | 3°81         | 3°80         | 0°16         | 14°68        | 115°00       |
| <b>26</b>       | 76°84697     | 3°18517      | 3°291        | 1°42         | 1°5114       | 1°5229       | 4°81         | 4°80         | 1°16         | 15°68        | 116°00       |
| <b>27</b>       | 127°16462    | 4°18517      | 4°291        | 2°42         | 2°5114       | 2°5229       | 5°81         | 5°80         | 2°16         | 16°68        | 117°00       |
| <b>28</b>       | 177°48226    | 5°18517      | 5°291        | 3°42         | 3°5114       | 3°5229       | 6°81         | 6°80         | 3°16         | 17°68        | 118°00       |
| <b>29</b>       | 227°79991    | 6°18517      | 6°291        | 4°42         | 4°5114       | 4°5229       | 0°86         | 0°85         | 4°16         | 18°68        | 119°00       |
| <b>30</b>       | 278°11755    | 0°13424      | 7°291        | 5°42         | 5°5114       | 5°5229       | 1°86         | 1°85         | 5°16         | 19°68        | 120°00       |
| <b>May 1</b>    | 328°43520    | 1°13424      | 8°291        | 6°42         | 6°5114       | 6°5229       | 2°86         | 2°85         | 6°16         | 20°68        | 121°00       |
| <b>2</b>        | 18°75285     | 2°13424      | 9°291        | 0°26         | 0°3559       | 0°3681       | 3°86         | 3°85         | 7°16         | 21°68        | 122°00       |
| <b>3</b>        | 69°07049     | 3°13424      | 10°291       | 1°26         | 1°3559       | 1°3681       | 4°86         | 4°85         | 0°99         | 22°68        | 123°00       |
| <b>4</b>        | 119°38814    | 4°13424      | 11°291       | 2°26         | 2°3559       | 2°3681       | 5°86         | 5°85         | 1°99         | 23°68        | 124°00       |
| <b>5</b>        | 169°70579    | 5°13424      | 12°291       | 3°26         | 3°3559       | 3°3681       | 6°86         | 6°85         | 2°99         | 24°68        | 125°00       |
| <b>6</b>        | 220°02343    | 6°13424      | 0°768        | 4°26         | 4°3559       | 4°3681       | 0°91         | 0°90         | 3°99         | 25°68        | 126°00       |
| <b>7</b>        | 270°34108    | 0°08331      | 1°768        | 5°26         | 5°3559       | 5°3681       | 1°91         | 1°90         | 4°99         | 26°68        | 127°00       |
| <b>8</b>        | 320°65873    | 1°08331      | 2°768        | 6°26         | 6°3559       | 6°3681       | 2°91         | 2°90         | 5°99         | 27°68        | 128°00       |
| <b>9</b>        | 10°97637     | 2°08331      | 3°768        | 0°10         | 0°2003       | 0°2133       | 3°91         | 3°90         | 6°99         | 28°68        | 129°00       |
| <b>10</b>       | 61°29402     | 3°08331      | 4°768        | 1°10         | 1°2003       | 1°2133       | 4°91         | 4°90         | 0°81         | 29°68        | 130°00       |
| <b>11</b>       | 111°61166    | 4°08331      | 5°768        | 2°10         | 2°2003       | 2°2133       | 5°91         | 5°90         | 1°81         | 30°68        | 131°00       |
| <b>12</b>       | 161°92931    | 5°08331      | 6°768        | 3°10         | 3°2003       | 3°2133       | 6°91         | 6°90         | 2°81         | 31°68        | 132°00       |
| <b>13</b>       | 212°24696    | 6°08331      | 7°768        | 4°10         | 4°2003       | 4°2133       | 0°96         | 0°95         | 3°81         | 32°68        | 133°00       |
| <b>14</b>       | 262°56460    | 0°03238      | 8°768        | 5°10         | 5°2003       | 5°2133       | 1°96         | 1°95         | 4°81         | 33°68        | 134°00       |
| <b>15</b>       | 312°88225    | 1°03238      | 9°768        | 6°10         | 6°2003       | 6°2133       | 2°96         | 2°95         | 5°81         | 34°68        | 135°00       |
| <b>16</b>       | 3°19990      | 2°03238      | 10°768       | 7°10         | 0°0448       | 0°0585       | 3°96         | 3°95         | 6°81         | 35°68        | 136°00       |
| <b>17</b>       | 53°51754     | 3°03238      | 11°768       | 0°94         | 1°0448       | 1°0585       | 4°96         | 4°95         | 0°63         | 36°68        | 137°00       |
| <b>18</b>       | 103°83519    | 4°03238      | 0°244        | 1°94         | 2°0448       | 2°0585       | 5°96         | 5°95         | 1°63         | 37°68        | 138°00       |
| <b>19</b>       | 154°15283    | 5°03238      | 1°244        | 2°94         | 3°0448       | 3°0585       | 0°01         | 0°00         | 2°63         | 38°68        | 139°00       |
| <b>20</b>       | 204°47048    | 6°03238      | 2°244        | 3°94         | 4°0448       | 4°0585       | 1°01         | 1°00         | 3°63         | 39°68        | 140°00       |
| <b>21</b>       | 254°78813    | 7°03238      | 3°244        | 4°94         | 5°0448       | 5°0585       | 2°01         | 2°00         | 4°63         | 40°68        | 141°00       |
| <b>22</b>       | 305°10577    | 0°98146      | 4°244        | 5°94         | 6°0448       | 6°0585       | 3°01         | 3°00         | 5°63         | 41°68        | 142°00       |
| <b>23</b>       | 355°42342    | 1°98146      | 5°244        | 6°94         | 7°0448       | 7°0585       | 4°01         | 4°00         | 6°63         | 42°68        | 143°00       |
| <b>24</b>       | 45°74107     | 2°98146      | 6°244        | 0°77         | 0°8893       | 0°9037       | 5°01         | 5°00         | 0°45         | 43°68        | 144°00       |
| <b>25</b>       | 96°05871     | 3°98146      | 7°244        | 1°77         | 1°8893       | 1°9037       | 6°01         | 6°00         | 1°45         | 44°68        | 145°00       |
| <b>26</b>       | 146°37636    | 4°98146      | 8°244        | 2°77         | 2°8893       | 2°9037       | 0°06         | 0°05         | 2°45         | 45°68        | 146°00       |
| <b>27</b>       | 196°69400    | 5°98146      | 9°244        | 3°77         | 3°8893       | 3°9037       | 1°06         | 1°05         | 3°45         | 46°68        | 147°00       |
| <b>28</b>       | 247°01165    | 6°98146      | 10°244       | 4°77         | 4°8893       | 4°9037       | 2°06         | 2°05         | 4°45         | 47°68        | 148°00       |
| <b>29</b>       | 297°32930    | 0°93053      | 11°244       | 5°77         | 5°8893       | 5°9037       | 3°06         | 3°05         | 5°45         | 48°68        | 149°00       |
| <b>30</b>       | 347°64694    | 1°93053      | 12°244       | 6°77         | 6°8893       | 6°9037       | 4°06         | 4°05         | 6°45         | 49°68        | 150°00       |
| <b>31</b>       | 37°96459     | 2°93053      | 0°721        | 0°61         | 0°7337       | 0°7488       | 5°06         | 5°05         | 0°28         | 0°53         | 151°00       |
| <b>June 1</b>   | 88°28224     | 3°93053      | 1°721        | 1°61         | 1°7337       | 1°7488       | 6°06         | 6°05         | 1°28         | 1°53         | 152°00       |
| <b>2</b>        | 138°59988    | 4°93053      | 2°721        | 2°61         | 2°7337       | 2°7488       | 0°11         | 0°10         | 2°28         | 2°53         | 153°00       |
| <b>3</b>        | 188°91753    | 5°93053      | 3°721        | 3°61         | 3°7337       | 3°7488       | 1°11         | 1°10         | 3°28         | 3°53         | 154°00       |
| <b>4</b>        | 239°23517    | 6°93053      | 4°721        | 4°61         | 4°7337       | 4°7488       | 2°11         | 2°10         | 4°28         | 4°53         | 155°00       |
| <b>5</b>        | 289°55282    | 0°87960      | 5°721        | 5°61         | 5°7337       | 5°7488       | 3°11         | 3°10         | 5°28         | 5°53         | 156°00       |
| <b>6</b>        | 339°87047    | 1°87960      | 6°721        | 6°61         | 6°7337       | 6°7488       | 4°11         | 4°10         | 6°28         | 6°53         | 157°00       |
| <b>7</b>        | 30°18811     | 2°87960      | 7°721        | 0°45         | 0°5782       | 0°5940       | 5°11         | 5°10         | 0°10         | 7°53         | 158°00       |

In Leap Year diminish the date in Columns 1, 13, by 1 day after Feb. 28.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Motions of Mean Longitude and the Arguments for Days

| 3             | 4   | 5       | 6    | 7            | 8    | 9      |      |       |              |
|---------------|-----|---------|------|--------------|------|--------|------|-------|--------------|
| Day           | N   | O       | P    | Q            | R    | S      | T    | U     | V            |
| <b>Apr 1</b>  |     |         |      | <sup>a</sup> |      |        |      |       | <sup>a</sup> |
| <b>17</b>     | 3   | 6 836 6 | 3 9  | 3 266        | 3 6  | 6 8502 | 6 90 | 6 840 | 6 5          |
| <b>18</b>     | 0 3 | 6 8171  | 0 7  | 6 89         | 0 68 | 0 6967 | 0 75 | 0 686 | 0 3          |
| <b>19</b>     | 0 3 | 1 68171 | 1 7  | 1 689        | 1 68 | 1 6967 | 1 75 | 1 686 | 1 3          |
| <b>20</b>     | 0 3 | 6 8171  | 2 7  | 2 689        | 2 68 | 2 6967 | 2 75 | 6 86  | 3            |
| <b>21</b>     | 0 3 | 3 68171 | 0 14 | 0 11         | 0 11 | 3 6967 | 3 75 | 3 686 | 3 3          |
| <b>22</b>     | 0 3 | 4 68171 | 1 14 | 1 112        | 1 11 | 4 6967 | 4 75 | 4 686 | 4 3          |
| <b>23</b>     | 0 3 | 5 68171 | 2 14 | 2 112        | 2 11 | 5 6967 | 5 75 | 5 686 | 5 3          |
| <b>24</b>     | 0 3 | 6 68171 | 3 14 | 3 11         | 3 11 | 6 6967 | 6 75 | 6 686 | 6 3          |
| <b>25</b>     | 0 3 | 0 5 716 | 0 56 | 0 535        | 0 53 | 0 5431 | 0 60 | 0 531 | 0 1          |
| <b>26</b>     | 0 3 | 1 52716 | 1 56 | 1 535        | 1 53 | 1 5431 | 1 60 | 1 531 | 1 1          |
| <b>27</b>     | 0 3 | 5 716   | 2 56 | 535          | 53   | 2 5431 | 2 60 | 2 531 | 2 1          |
| <b>28</b>     | 3   | 3 52716 | 3 56 | 3 535        | 3 53 | 3 5431 | 3 60 | 3 531 | 3 1          |
| <b>29</b>     | 3   | 4 5 716 | 0 99 | 0 958        | 0 95 | 4 5431 | 4 60 | 4 531 | 4 1          |
| <b>30</b>     | 0 3 | 5 5 716 | 1 99 | 1 958        | 1 95 | 5 5431 | 5 60 | 5 531 | 5 1          |
| <b>May 1</b>  | 0 3 | 6 5 716 | 99   | 2 958        | 2 95 | 6 5431 | 6 60 | 6 531 | 6 1          |
| <b>2</b>      | 3   | 0 37 6  | 0 41 | 0 381        | 0 37 | 0 3896 | 0 45 | 0 377 | 0 0          |
| <b>3</b>      | 0 3 | 1 37 60 | 1 41 | 1 381        | 1 37 | 1 3896 | 1 45 | 1 377 | 1 0          |
| <b>4</b>      | 0 3 | 2 37 60 | 2 41 | 2 381        | 37   | 2 3896 | 2 45 | 2 377 | 2 0          |
| <b>5</b>      | 0 3 | 3 37260 | 3 41 | 3 381        | 3 37 | 3 3896 | 3 45 | 3 377 | 3 0          |
| <b>6</b>      | 3   | 4 37260 | 0 84 | 0 804        | 0 80 | 4 3896 | 4 45 | 4 377 | 4 0          |
| <b>7</b>      | 0 3 | 5 3726  | 1 84 | 1 804        | 1 80 | 5 3896 | 5 45 | 5 377 | 5 0          |
| <b>8</b>      | 0 4 | 6 37 60 | 84   | 804          | 2 80 | 6 3896 | 6 45 | 6 377 | 6 0          |
| <b>9</b>      | 0 4 | 0 1805  | 0 6  | 0 27         | 0 2  | 0 2360 | 0 30 | 0 2 3 | 7 0          |
| <b>10</b>     | 0 4 | 1 1805  | 1 26 | 1 2 7        | 1 22 | 1 2360 | 1 30 | 1 3   | 0 8          |
| <b>11</b>     | 0 4 | 1805    | 2 6  | 2 2 7        | 2 2  | 2360   | 2 30 | 2 223 | 1 8          |
| <b>12</b>     | 0 4 | 3 218 5 | 3 26 | 3 7          | 3    | 3 2360 | 3 30 | 3 223 | 2 8          |
| <b>13</b>     | 0 4 | 4 21805 | 0 68 | 0 650        | 0 64 | 4 2360 | 4 30 | 4 3   | 3 8          |
| <b>14</b>     | 0 4 | 5 1805  | 1 68 | 1 650        | 1 64 | 5 36   | 5 30 | 5 2 3 | 4 8          |
| <b>15</b>     | 0 4 | 6 18 5  | 68   | 65           | 64   | 6 2360 | 6 30 | 6 223 | 5 8          |
| <b>16</b>     | 0 4 | 0 06350 | 0 11 | 0 073        | 0 07 | 0 0824 | 0 15 | 0 068 | 6 8          |
| <b>17</b>     | 0 4 | 1 06350 | 1 11 | 1 073        | 1 07 | 1 08 4 | 1 15 | 1 068 | 0 6          |
| <b>18</b>     | 0 4 | 635     | 2 11 | 2 73         | 07   | 2 0824 | 2 15 | 2 068 | 1 6          |
| <b>19</b>     | 0 4 | 3 0635  | 3 11 | 3 73         | 3 7  | 3 08 4 | 3 15 | 3 068 | 2 6          |
| <b>20</b>     | 0 4 | 4 0635  | 0 53 | 0 496        | 0 49 | 4 08 4 | 4 15 | 4 068 | 3 6          |
| <b>21</b>     | 0 4 | 5 06350 | 1 53 | 1 496        | 1 49 | 5 08 4 | 5 15 | 5 068 | 4 6          |
| <b>22</b>     | 0 4 | 6 06350 | 2 53 | 2 496        | 2 49 | 6 0824 | 6 15 | 6 068 | 5 6          |
| <b>23</b>     | 0 4 | 7 06350 | 3 53 | 3 496        | 3 49 | 7 0824 | 0 00 | 7 068 | 6 6          |
| <b>24</b>     | 0 4 | 0 90894 | 0 96 | 0 919        | 0 91 | 0 9289 | 1 00 | 0 914 | 0 4          |
| <b>25</b>     | 0 4 | 1 90894 | 1 96 | 1 919        | 1 91 | 1 9 89 | 2 0  | 1 914 | 1 4          |
| <b>26</b>     | 0 4 | 90894   | 2 96 | 2 919        | 2 91 | 2 9289 | 3 00 | 2 914 | 2 4          |
| <b>27</b>     | 0 4 | 3 90894 | 0 38 | 0 342        | 0 33 | 3 9 89 | 4 00 | 3 914 | 3 4          |
| <b>28</b>     | 0 4 | 4 9 894 | 1 38 | 1 34         | 1 33 | 4 9 89 | 5 0  | 4 914 | 4 4          |
| <b>29</b>     | 0 4 | 5 90894 | 2 38 | 34           | 2 33 | 5 9 89 | 6 0  | 5 914 | 5 4          |
| <b>30</b>     | 0 4 | 6 90894 | 3 38 | 3 342        | 3 33 | 6 9 89 | 7 00 | 6 914 | 6 4          |
| <b>31</b>     | 0 4 | 0 75439 | 0 80 | 0 765        | 0 76 | 0 7753 | 0 85 | 0 76  | 0 3          |
| <b>June 1</b> | 0 4 | 1 75439 | 1 80 | 1 765        | 1 76 | 1 7753 | 1 85 | 1 760 | 1 3          |
| <b>2</b>      | 0 4 | 75439   | 80   | 2 765        | 2 76 | 2 7753 | 2 85 | 760   | 2 3          |
| <b>3</b>      | 0 4 | 3 75439 | 0 23 | 0 188        | 0 18 | 3 7753 | 3 85 | 3 760 | 3 3          |
| <b>4</b>      | 0 4 | 4 75439 | 1 3  | 1 188        | 1 18 | 4 7753 | 4 85 | 4 760 | 4 3          |
| <b>5</b>      | 0 4 | 5 75439 | 2 23 | 2 188        | 18   | 5 7753 | 5 85 | 5 760 | 5 3          |
| <b>6</b>      | 0 4 | 6 75439 | 3 23 | 3 188        | 3 18 | 6 7753 | 6 85 | 6 760 | 6 3          |
| <b>7</b>      | 0 4 | 0 59984 | 0 65 | 0 611        | 0 60 | 0 6218 | 0 70 | 0 605 | 0 1          |

I L pY dmi nth dt Clm by dy ft Fb 8

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII *continued*      Motions of Mean Longitude and the Arguments for Days

| I             | 2          | 3       | 4      | 5    | 6      | 7      | 8    | 9    | 10   | 11    | 12          |
|---------------|------------|---------|--------|------|--------|--------|------|------|------|-------|-------------|
| Day           | Mean Long. | A       | B      | C    | D      | E      | F    | G    | H    | I     | J— $\alpha$ |
|               | °          | d       | d      | d    | d      | d      | d    | d    | d    | d     | d           |
| <b>June 8</b> | 80°50576   | 3'87960 | 8'721  | 1'45 | 1'5782 | 1'5940 | 6'11 | 6'10 | 1'10 | 8'53  | 159'00      |
| <b>9</b>      | 130°82341  | 4'87960 | 9'721  | 2'45 | 2'5782 | 2'5940 | 0'17 | 0'15 | 2'10 | 9'53  | 160'00      |
| <b>10</b>     | 181°14105  | 5'87960 | 10'721 | 3'45 | 3'5782 | 3'5940 | 1'17 | 1'15 | 3'10 | 10'53 | 161'00      |
| <b>11</b>     | 231°45870  | 6'87960 | 11'721 | 4'45 | 4'5782 | 4'5940 | 2'17 | 2'15 | 4'10 | 11'53 | 162'00      |
| <b>12</b>     | 281°77635  | 0'82868 | 0'198  | 5'45 | 5'5782 | 5'5940 | 3'17 | 3'15 | 5'10 | 12'53 | 163'00      |
| <b>13</b>     | 332°09399  | 1'82868 | 1'198  | 6'45 | 6'5782 | 6'5940 | 4'17 | 4'15 | 6'10 | 13'53 | 164'00      |
| <b>14</b>     | 22°41164   | 2'82868 | 2'198  | 0'29 | 0'4227 | 0'4392 | 5'17 | 5'15 | 7'10 | 14'53 | 165'00      |
| <b>15</b>     | 72°72928   | 3'82868 | 3'198  | 1'29 | 1'4227 | 1'4392 | 6'17 | 6'15 | 0'92 | 15'53 | 166'00      |
| <b>16</b>     | 123°04693  | 4'82868 | 4'198  | 2'29 | 2'4227 | 2'4392 | 0'22 | 0'20 | 1'92 | 16'53 | 167'00      |
| <b>17</b>     | 173°36458  | 5'82868 | 5'198  | 3'29 | 3'4227 | 3'4392 | 1'22 | 1'20 | 2'92 | 17'53 | 168'00      |
| <b>18</b>     | 223°68222  | 6'82868 | 6'198  | 4'29 | 4'4227 | 4'4392 | 2'22 | 2'20 | 3'92 | 18'53 | 169'00      |
| <b>19</b>     | 273°99987  | 0'77775 | 7'198  | 5'29 | 5'4227 | 5'4392 | 3'22 | 3'20 | 4'92 | 19'53 | 170'00      |
| <b>20</b>     | 324°31752  | 1'77775 | 8'198  | 6'29 | 6'4227 | 6'4392 | 4'22 | 4'20 | 5'92 | 20'53 | 171'00      |
| <b>21</b>     | 14°63516   | 2'77775 | 9'198  | 0'13 | 0'2671 | 0'2844 | 5'22 | 5'20 | 6'92 | 21'53 | 172'00      |
| <b>22</b>     | 64°95281   | 3'77775 | 10'198 | 1'13 | 1'2671 | 1'2844 | 6'22 | 6'20 | 0'75 | 22'53 | 173'00      |
| <b>23</b>     | 115°27045  | 4'77775 | 11'198 | 2'13 | 2'2671 | 2'2844 | 0'27 | 0'25 | 1'75 | 23'53 | 174'00      |
| <b>24</b>     | 165°58810  | 5'77775 | 12'198 | 3'13 | 3'2671 | 3'2844 | 1'27 | 1'25 | 2'75 | 24'53 | 175'00      |
| <b>25</b>     | 215°90575  | 6'77775 | 0'675  | 4'13 | 4'2671 | 4'2844 | 2'27 | 2'25 | 3'75 | 25'53 | 176'00      |
| <b>26</b>     | 266°22339  | 0'72682 | 1'675  | 5'13 | 5'2671 | 5'2844 | 3'27 | 3'25 | 4'75 | 26'53 | 177'00      |
| <b>27</b>     | 316°54104  | 1'72682 | 2'675  | 6'13 | 6'2671 | 6'2844 | 4'27 | 4'25 | 5'75 | 27'53 | 178'00      |
| <b>28</b>     | 6°85869    | 2'72682 | 3'675  | 7'13 | 0'1116 | 0'1296 | 5'27 | 5'25 | 6'75 | 28'53 | 179'00      |
| <b>29</b>     | 57°17633   | 3'72682 | 4'675  | 0'97 | 1'1116 | 1'1296 | 6'27 | 6'25 | 0'57 | 29'53 | 180'00      |
| <b>30</b>     | 107°49398  | 4'72682 | 5'675  | 1'97 | 2'1116 | 2'1296 | 0'32 | 0'30 | 1'57 | 30'53 | 181'00      |
| <b>July 1</b> | 157°81162  | 5'72682 | 6'675  | 2'97 | 3'1116 | 3'1296 | 1'32 | 1'30 | 2'57 | 31'53 | 182'00      |
| <b>2</b>      | 208°12927  | 6'72682 | 7'675  | 3'97 | 4'1116 | 4'1296 | 2'32 | 2'30 | 3'57 | 32'53 | 183'00      |
| <b>3</b>      | 258°44692  | 0'67589 | 8'675  | 4'97 | 5'1116 | 5'1296 | 3'32 | 3'30 | 4'57 | 33'53 | 184'00      |
| <b>4</b>      | 308°76456  | 1'67589 | 9'675  | 5'97 | 6'1116 | 6'1296 | 4'32 | 4'30 | 5'57 | 34'53 | 185'00      |
| <b>5</b>      | 359°08221  | 2'67589 | 10'675 | 6'97 | 7'1116 | 7'1296 | 5'32 | 5'30 | 6'57 | 35'53 | 186'00      |
| <b>6</b>      | 49°39986   | 3'67589 | 11'675 | 0'81 | 0'9561 | 0'9747 | 6'32 | 6'30 | 0'39 | 36'53 | 187'00      |
| <b>7</b>      | 99°71750   | 4'67589 | 0'151  | 1'81 | 1'9561 | 1'9747 | 0'37 | 0'35 | 1'39 | 37'53 | 188'00      |
| <b>8</b>      | 150°03515  | 5'67589 | 1'151  | 2'81 | 2'9561 | 2'9747 | 1'37 | 1'35 | 2'39 | 38'53 | 189'00      |
| <b>9</b>      | 200°35280  | 6'67589 | 2'151  | 3'81 | 3'9561 | 3'9747 | 2'37 | 2'35 | 3'39 | 39'53 | 190'00      |
| <b>10</b>     | 250°67044  | 0'62497 | 3'151  | 4'81 | 4'9561 | 4'9747 | 3'37 | 3'35 | 4'39 | 40'53 | 191'00      |
| <b>11</b>     | 300°98809  | 1'62497 | 4'151  | 5'81 | 5'9561 | 5'9747 | 4'37 | 4'35 | 5'39 | 41'53 | 192'00      |
| <b>12</b>     | 351°30573  | 2'62497 | 5'151  | 6'81 | 6'9561 | 6'9747 | 5'37 | 5'35 | 6'39 | 42'53 | 193'00      |
| <b>13</b>     | 41°62338   | 3'62497 | 6'151  | 0'65 | 0'8005 | 0'8199 | 6'37 | 6'35 | 0'21 | 43'53 | 194'00      |
| <b>14</b>     | 91°94103   | 4'62497 | 7'151  | 1'65 | 1'8005 | 1'8199 | 0'42 | 0'40 | 1'21 | 44'53 | 195'00      |
| <b>15</b>     | 142°25867  | 5'62497 | 8'151  | 2'65 | 2'8005 | 2'8199 | 1'42 | 1'40 | 2'21 | 45'53 | 196'00      |
| <b>16</b>     | 192°57632  | 6'62497 | 9'151  | 3'65 | 3'8005 | 3'8199 | 2'42 | 2'40 | 3'21 | 46'53 | 197'00      |
| <b>17</b>     | 242°89397  | 0'57404 | 10'151 | 4'65 | 4'8005 | 4'8199 | 3'42 | 3'40 | 4'21 | 47'53 | 198'00      |
| <b>18</b>     | 293°21161  | 1'57404 | 11'151 | 5'65 | 5'8005 | 5'8199 | 4'42 | 4'40 | 5'21 | 48'53 | 199'00      |
| <b>19</b>     | 343°52926  | 2'57404 | 12'151 | 6'65 | 6'8005 | 6'8199 | 5'42 | 5'40 | 6'21 | 49'53 | 200'00      |
| <b>20</b>     | 33°84690   | 3'57404 | 0'628  | 0'48 | 0'6450 | 0'6651 | 6'42 | 6'40 | 0'04 | 0'37  | 201'00      |
| <b>21</b>     | 84°16455   | 4'57404 | 1'628  | 1'48 | 1'6450 | 1'6651 | 0'47 | 0'45 | 1'04 | 1'37  | 202'00      |
| <b>22</b>     | 134°48220  | 5'57404 | 2'628  | 2'48 | 2'6450 | 2'6651 | 1'47 | 1'45 | 2'04 | 2'37  | 203'00      |
| <b>23</b>     | 184°79984  | 6'57404 | 3'628  | 3'48 | 3'6450 | 3'6651 | 2'47 | 2'45 | 3'04 | 3'37  | 204'00      |
| <b>24</b>     | 235°11749  | 0'52311 | 4'628  | 4'48 | 4'6450 | 4'6651 | 3'47 | 3'45 | 4'04 | 4'37  | 205'00      |
| <b>25</b>     | 285°43514  | 1'52311 | 5'628  | 5'48 | 5'6450 | 5'6651 | 4'47 | 4'45 | 5'04 | 5'37  | 206'00      |
| <b>26</b>     | 335°75278  | 2'52311 | 6'628  | 6'48 | 6'6450 | 6'6651 | 5'47 | 5'45 | 6'04 | 6'37  | 207'00      |
| <b>27</b>     | 26°07043   | 3'52311 | 7'628  | 0'32 | 0'4895 | 0'5103 | 6'47 | 6'45 | 7'04 | 7'37  | 208'00      |
| <b>28</b>     | 76°38807   | 4'52311 | 8'628  | 1'32 | 1'4895 | 1'5103 | 0'52 | 0'50 | 0'86 | 8'37  | 209'00      |
| <b>29</b>     | 126°70572  | 5'52311 | 9'628  | 2'32 | 2'4895 | 2'5103 | 1'52 | 1'50 | 1'86 | 9'37  | 210'00      |

In Leap Year diminish the date in Columns 1, 23, by 1 day after Feb. 28.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Motions of Mean Longitude and the Arguments for Days

| 3             | 4   | 5       | 6    | 7     | 8    | 9      |      |       |     |
|---------------|-----|---------|------|-------|------|--------|------|-------|-----|
| D y           | N   | O       | P    | Q     | R    | S      | T    | U     | V   |
|               |     |         |      | d     |      | l      |      | d     |     |
| <b>June 8</b> | 0 4 | 1 59984 | 1 65 | 1 611 | 1 60 | 1 6 18 | 1 70 | 1 605 | 1 1 |
| <b>9</b>      | 4   | 59984   | 65   | 611   | 2 60 | 6 18   | 2 70 | 605   | 2 1 |
| <b>10</b>     | 0 4 | 3 59984 | 07   | 034   | 0 03 | 3 6218 | 3 70 | 3 605 | 3 1 |
| <b>11</b>     | 4   | 4 59984 | 1 7  | 1 034 | 1 03 | 4 6 18 | 4 70 | 4 605 | 4 1 |
| <b>12</b>     | 4   | 5 59984 | 7    | 034   | 2 3  | 5 6 18 | 5 70 | 5 605 | 5 1 |
| <b>13</b>     | 0 4 | 6 59984 | 3 7  | 3 34  | 3 3  | 6 6 18 | 6 70 | 6 605 | 6 1 |
| <b>14</b>     | 5   | 0 445 9 | 50   | 0 457 | 0 45 | 0 4682 | 0 55 | 0 451 | 7 1 |
| <b>15</b>     | 0 5 | 1 445 9 | 1 50 | 1 457 | 1 45 | 1 468  | 1 55 | 1 451 | 0 9 |
| <b>16</b>     | 0 5 | 44529   | 2 5  | 457   | 45   | 468    | 55   | 451   | 1 9 |
| <b>17</b>     | 0 5 | 3 445 9 | 3 50 | 3 457 | 3 45 | 3 4682 | 3 55 | 3 451 | 2 9 |
| <b>18</b>     | 5   | 4 445 9 | 92   | 0 880 | 87   | 4 468  | 4 55 | 4 451 | 3 9 |
| <b>19</b>     | 0 5 | 5 445 9 | 1 9  | 1 880 | 1 87 | 5 468  | 5 55 | 5 451 | 4 9 |
| <b>20</b>     | 0 5 | 6 44529 | 9    | 880   | 87   | 6 4682 | 6 55 | 6 451 | 5 9 |
| <b>21</b>     | 0 5 | 9073    | 0 35 | 0 303 | 0 9  | 3147   | 0 40 | 0 297 | 6 9 |
| <b>22</b>     | 5   | 1 9 73  | 1 35 | 1 303 | 1 9  | 1 3147 | 1 40 | 1 297 | 0 7 |
| <b>23</b>     | 0 5 | 2 9073  | 2 35 | 2 303 | 2 29 | 2 3147 | 4    | 2 297 | 1 7 |
| <b>24</b>     | 0 5 | 3 29073 | 3 35 | 3 3 3 | 3 29 | 3 3147 | 3 40 | 3 297 | 7   |
| <b>25</b>     | 0 5 | 4 29 73 | 0 77 | 0 726 | 0 72 | 4 3147 | 4 40 | 4 297 | 3 7 |
| <b>26</b>     | 5   | 5 9 73  | 1 77 | 1 726 | 1 7  | 5 3147 | 5 40 | 5 297 | 4 7 |
| <b>27</b>     | 0 5 | 6 9 73  | 77   | 2 726 | 2 7  | 6 3147 | 6 40 | 6 97  | 5 7 |
| <b>28</b>     | 0 5 | 0 13618 | 0 19 | 0 149 | 0 14 | 0 1611 | 0 5  | 0 143 | 6 7 |
| <b>29</b>     | 0 5 | 1 13618 | 1 19 | 1 149 | 1 14 | 1 1611 | 1 5  | 1 143 | 0 5 |
| <b>30</b>     | 0 5 | 13618   | 2 19 | 149   | 2 14 | 2 1611 | 25   | 2 143 | 1 5 |
| <b>July 1</b> | 0 5 | 3 13618 | 3 19 | 3 149 | 3 14 | 3 1611 | 3 5  | 3 143 | 2 5 |
| <b>2</b>      | 0 5 | 4 13618 | 0 6  | 0 57  | 0 56 | 4 1611 | 4 25 | 4 143 | 3 5 |
| <b>3</b>      | 0 5 | 5 13618 | 1 6  | 1 57  | 1 56 | 5 1611 | 5 25 | 5 143 | 4 5 |
| <b>4</b>      | 0 5 | 6 13618 | 6    | 57    | 56   | 6 1611 | 6 5  | 6 143 | 5 5 |
| <b>5</b>      | 0 5 | 7 13618 | 0 04 | 3 57  | 3 56 | 0 0076 | 0 10 | 7 143 | 6 5 |
| <b>6</b>      | 5   | 0 98163 | 1 04 | 995   | 0 98 | 1 0076 | 1 10 | 0 988 | 4   |
| <b>7</b>      | 0 5 | 1 98163 | 2 04 | 1 995 | 1 98 | 2 0076 | 10   | 1 988 | 1 4 |
| <b>8</b>      | 0 5 | 2 98163 | 3 04 | 2 995 | 2 98 | 3 0076 | 3 1  | 2 988 | 2 4 |
| <b>9</b>      | 0 5 | 3 98163 | 0 47 | 0 418 | 0 41 | 4 076  | 4 10 | 3 988 | 3 4 |
| <b>10</b>     | 0 5 | 4 98163 | 1 47 | 1 418 | 1 41 | 5 0076 | 5 10 | 4 988 | 4 4 |
| <b>11</b>     | 5   | 5 98163 | 47   | 418   | 41   | 6 076  | 6 10 | 5 988 | 5 4 |
| <b>12</b>     | 0 5 | 6 98163 | 3 47 | 3 418 | 3 41 | 7 0076 | 7 10 | 6 988 | 6 4 |
| <b>13</b>     | 0 5 | 827 7   | 0 89 | 0 841 | 0 83 | 0 8540 | 0 95 | 0 834 | 0 2 |
| <b>14</b>     | 0 5 | 1 8 707 | 1 89 | 1 841 | 1 83 | 1 8540 | 1 95 | 1 834 | 1 2 |
| <b>15</b>     | 5   | 2 8 7 7 | 89   | 841   | 83   | 8540   | 2 95 | 2 834 | 2   |
| <b>16</b>     | 0 5 | 3 8 7 7 | 31   | 0 264 | 5    | 3 854  | 3 95 | 3 834 | 3 2 |
| <b>17</b>     | 0 5 | 4 8 707 | 1 31 | 1 64  | 1 25 | 4 854  | 4 95 | 4 834 | 4 2 |
| <b>18</b>     | 0 5 | 5 8 707 | 2 31 | 64    | 5    | 5 854  | 5 95 | 5 834 | 5   |
| <b>19</b>     | 0 5 | 6 8 707 | 3 31 | 3 64  | 3 5  | 6 8540 | 6 95 | 6 834 | 6 2 |
| <b>20</b>     | 0 6 | 67 5    | 0 74 | 0 686 | 0 68 | 0 7 4  | 0 80 | 680   | 0 0 |
| <b>21</b>     | 0 6 | 1 67 5  | 1 74 | 1 686 | 1 68 | 1 7 04 | 1 80 | 1 68  | 1 0 |
| <b>22</b>     | 0 6 | 2 67 5  | 2 74 | 2 686 | 2 68 | 2 70 4 | 2 80 | 2 680 | 2 0 |
| <b>23</b>     | 0 6 | 3 67 52 | 0 16 | 0 109 | 0 1  | 3 70 4 | 3 80 | 3 68  | 3 0 |
| <b>24</b>     | 0 6 | 4 67 5  | 1 16 | 1 1 9 | 1 1  | 4 70 4 | 4 8  | 4 68  | 4 0 |
| <b>25</b>     | 0 6 | 5 6725  | 16   | 2 1 9 | 2 10 | 5 7004 | 5 8  | 5 680 | 5 0 |
| <b>26</b>     | 0 6 | 6 67 52 | 3 16 | 3 1 9 | 3 10 | 6 7004 | 6 80 | 6 680 | 6 0 |
| <b>27</b>     | 6   | 0 51797 | 0 59 | 0 53  | 0 52 | 0 5469 | 0 65 | 0 525 | 7 0 |
| <b>28</b>     | 0 6 | 1 51797 | 1 59 | 1 532 | 1 52 | 1 5469 | 1 65 | 1 525 | 0 8 |
| <b>29</b>     | 0 6 | 51797   | 2 59 | 53    | 2 5  | 5469   | 65   | 2 5 5 | 1 8 |

I L p X dimi l h t d t i O l m by d y f t F l 8

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII *continued*      Motions of Mean Longitude and the Arguments for Days

| 1              | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           | 12           |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day            | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | I            | J— <i>a</i>  |
|                | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>July 30</b> | 177°02337    | 6°52311      | 10°628       | 3°32         | 3°4895       | 3°5103       | 2°52         | 2°50         | 2°86         | 10°37        | 211°00       |
| <b>31</b>      | 227°34101    | 0°47219      | 11°628       | 4°32         | 4°4895       | 4°5103       | 3°52         | 3°50         | 3°86         | 11°37        | 212°00       |
| <b>Aug. 1</b>  | 277°65866    | 1°47219      | 0°105        | 5°32         | 5°4895       | 5°5103       | 4°52         | 4°50         | 4°86         | 12°37        | 213°00       |
| <b>2</b>       | 327°97631    | 2°47219      | 1°105        | 6°32         | 6°4895       | 6°5103       | 5°52         | 5°50         | 5°86         | 13°37        | 214°00       |
| <b>3</b>       | 18°29395     | 3°47219      | 2°105        | 0°16         | 0°3339       | 0°3555       | 6°52         | 6°50         | 6°86         | 14°37        | 215°00       |
| <b>4</b>       | 68°61160     | 4°47219      | 3°105        | 1°16         | 1°3339       | 1°3555       | 0°57         | 0°55         | 0°68         | 15°37        | 216°00       |
| <b>5</b>       | 118°92924    | 5°47219      | 4°105        | 2°16         | 2°3339       | 2°3555       | 1°57         | 1°55         | 1°68         | 16°37        | 217°00       |
| <b>6</b>       | 169°24689    | 6°47219      | 5°105        | 3°16         | 3°3339       | 3°3555       | 2°57         | 2°55         | 2°68         | 17°37        | 218°00       |
| <b>7</b>       | 219°56454    | 0°42126      | 6°105        | 4°16         | 4°3339       | 4°3555       | 3°57         | 3°55         | 3°68         | 18°37        | 219°00       |
| <b>8</b>       | 269°88218    | 1°42126      | 7°105        | 5°16         | 5°3339       | 5°3555       | 4°57         | 4°55         | 4°68         | 19°37        | 220°00       |
| <b>9</b>       | 320°19983    | 2°42126      | 8°105        | 6°16         | 6°3339       | 6°3555       | 5°57         | 5°55         | 5°68         | 20°37        | 221°00       |
| <b>10</b>      | 10°51748     | 3°42126      | 9°105        | 0°00         | 0°1784       | 0°2007       | 6°57         | 6°55         | 6°68         | 21°37        | 222°00       |
| <b>11</b>      | 60°83512     | 4°42126      | 10°105       | 1°00         | 1°1784       | 1°2007       | 0°62         | 0°60         | 0°51         | 22°37        | 223°00       |
| <b>12</b>      | 111°15277    | 5°42126      | 11°105       | 2°00         | 2°1784       | 2°2007       | 1°62         | 1°60         | 1°51         | 23°37        | 224°00       |
| <b>13</b>      | 161°47042    | 6°42126      | 12°105       | 3°00         | 3°1784       | 3°2007       | 2°62         | 2°60         | 2°51         | 24°37        | 225°00       |
| <b>14</b>      | 211°78806    | 0°37033      | 0°582        | 4°00         | 4°1784       | 4°2007       | 3°62         | 3°60         | 3°51         | 25°37        | 226°00       |
| <b>15</b>      | 262°10571    | 1°37033      | 1°582        | 5°00         | 5°1784       | 5°2007       | 4°62         | 4°60         | 4°51         | 26°37        | 227°00       |
| <b>16</b>      | 312°42335    | 2°37033      | 2°582        | 6°00         | 6°1784       | 6°2007       | 5°62         | 5°60         | 5°51         | 27°37        | 228°00       |
| <b>17</b>      | 2°74100      | 3°37033      | 3°582        | 7°00         | 0°0228       | 0°0459       | 6°62         | 6°60         | 6°51         | 28°37        | 229°00       |
| <b>18</b>      | 53°05865     | 4°37033      | 4°582        | 0°84         | 1°0228       | 1°0459       | 0°67         | 0°65         | 0°33         | 29°37        | 230°00       |
| <b>19</b>      | 103°37629    | 5°37033      | 5°582        | 1°84         | 2°0228       | 2°0459       | 1°67         | 1°65         | 1°33         | 30°37        | 231°00       |
| <b>20</b>      | 153°69394    | 6°37033      | 6°582        | 2°84         | 3°0228       | 3°0459       | 2°67         | 2°65         | 2°33         | 31°37        | 232°00       |
| <b>21</b>      | 204°01159    | 0°31940      | 7°582        | 3°84         | 4°0228       | 4°0459       | 3°67         | 3°65         | 3°33         | 32°37        | 233°00       |
| <b>22</b>      | 254°32923    | 1°31940      | 8°582        | 4°84         | 5°0228       | 5°0459       | 4°67         | 4°65         | 4°33         | 33°37        | 234°00       |
| <b>23</b>      | 304°64688    | 2°31940      | 9°582        | 5°84         | 6°0228       | 6°0459       | 5°67         | 5°65         | 5°33         | 34°37        | 235°00       |
| <b>24</b>      | 354°96452    | 3°31940      | 10°582       | 6°84         | 7°0228       | 7°0459       | 6°67         | 6°65         | 6°33         | 35°37        | 236°00       |
| <b>25</b>      | 45°28217     | 4°31940      | 11°582       | 0°68         | 0°8673       | 0°8910       | 0°72         | 0°70         | 0°15         | 36°37        | 237°00       |
| <b>26</b>      | 95°59982     | 5°31940      | 0°058        | 1°68         | 1°8673       | 1°8910       | 1°72         | 1°70         | 1°15         | 37°37        | 238°00       |
| <b>27</b>      | 145°91746    | 6°31940      | 1°058        | 2°68         | 2°8673       | 2°8910       | 2°72         | 2°70         | 2°15         | 38°37        | 239°00       |
| <b>28</b>      | 196°23511    | 0°26848      | 2°058        | 3°68         | 3°8673       | 3°8910       | 3°72         | 3°70         | 3°15         | 39°37        | 240°00       |
| <b>29</b>      | 246°55276    | 1°26848      | 3°058        | 4°68         | 4°8673       | 4°8910       | 4°72         | 4°70         | 4°15         | 40°37        | 241°00       |
| <b>30</b>      | 296°87040    | 2°26848      | 4°058        | 5°68         | 5°8673       | 5°8910       | 5°72         | 5°70         | 5°15         | 41°37        | 242°00       |
| <b>31</b>      | 347°18805    | 3°26848      | 5°058        | 6°68         | 6°8673       | 6°8910       | 6°72         | 6°70         | 6°15         | 42°37        | 243°00       |
| <b>Sept. 1</b> | 37°50569     | 4°26848      | 6°058        | 0°52         | 0°7118       | 0°7362       | 0°77         | 0°75         | 7°15         | 43°37        | 244°00       |
| <b>2</b>       | 87°82334     | 5°26848      | 7°058        | 1°52         | 1°7118       | 1°7362       | 1°77         | 1°75         | 0°97         | 44°37        | 245°00       |
| <b>3</b>       | 138°14099    | 6°26848      | 8°058        | 2°52         | 2°7118       | 2°7362       | 2°77         | 2°75         | 1°97         | 45°37        | 246°00       |
| <b>4</b>       | 188°45863    | 0°21755      | 9°058        | 3°52         | 3°7118       | 3°7362       | 3°77         | 3°75         | 2°97         | 46°37        | 247°00       |
| <b>5</b>       | 238°77628    | 1°21755      | 10°058       | 4°52         | 4°7118       | 4°7362       | 4°77         | 4°75         | 3°97         | 47°37        | 248°00       |
| <b>6</b>       | 289°09393    | 2°21755      | 11°058       | 5°52         | 5°7118       | 5°7362       | 5°77         | 5°75         | 4°97         | 48°37        | 249°00       |
| <b>7</b>       | 339°41157    | 3°21755      | 12°058       | 6°52         | 6°7118       | 6°7362       | 6°77         | 6°75         | 5°97         | 49°37        | 250°00       |
| <b>8</b>       | 29°72922     | 4°21755      | 0°535        | 0°36         | 0°5562       | 0°5814       | 0°82         | 0°80         | 6°97         | 0°21         | 251°00       |
| <b>9</b>       | 80°04687     | 5°21755      | 1°535        | 1°36         | 1°5562       | 1°5814       | 1°82         | 1°80         | 0°80         | 1°21         | 252°00       |
| <b>10</b>      | 130°36451    | 6°21755      | 2°535        | 2°36         | 2°5562       | 2°5814       | 2°82         | 2°80         | 1°80         | 2°21         | 253°00       |
| <b>11</b>      | 180°68216    | 0°16662      | 3°535        | 3°36         | 3°5562       | 3°5814       | 3°82         | 3°80         | 2°80         | 3°21         | 254°00       |
| <b>12</b>      | 230°99980    | 1°16662      | 4°535        | 4°36         | 4°5562       | 4°5814       | 4°82         | 4°80         | 3°80         | 4°21         | 255°00       |
| <b>13</b>      | 281°31745    | 2°16662      | 5°535        | 5°36         | 5°5562       | 5°5814       | 5°82         | 5°80         | 4°80         | 5°21         | 256°00       |
| <b>14</b>      | 331°63510    | 3°16662      | 6°535        | 6°36         | 6°5562       | 6°5814       | 6°82         | 6°80         | 5°80         | 6°21         | 257°00       |
| <b>15</b>      | 21°95274     | 4°16662      | 7°535        | 0°19         | 0°4007       | 0°4266       | 0°87         | 0°85         | 6°80         | 7°21         | 258°00       |
| <b>16</b>      | 72°27039     | 5°16662      | 8°535        | 1°19         | 1°4007       | 1°4266       | 1°87         | 1°85         | 0°62         | 8°21         | 259°00       |
| <b>17</b>      | 122°58804    | 6°16662      | 9°535        | 2°19         | 2°4007       | 2°4266       | 2°87         | 2°85         | 1°62         | 9°21         | 260°00       |
| <b>18</b>      | 172°90568    | 0°11570      | 10°535       | 3°19         | 3°4007       | 3°4266       | 3°87         | 3°85         | 2°62         | 10°21        | 261°00       |
| <b>19</b>      | 223°22333    | 1°11570      | 11°535       | 4°19         | 4°4007       | 4°4266       | 4°87         | 4°85         | 3°62         | 11°21        | 262°00       |

In Leap Year diminish the date in Columns 1, 13, by 1 day after Feb. 28.



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII *continued*

Motions of Mean Longitude and the Arguments for Days

| 3              | 4   | 5       | 6    | 7     | 8    | 9      |      |       |     |
|----------------|-----|---------|------|-------|------|--------|------|-------|-----|
| Day            | N   | O       | P    | Q     | R    | S      | T    | U     | V   |
|                |     |         |      |       | a    |        |      | d     | d   |
| <b>July 30</b> | 6   | 3 51797 | 0 1  | 3 532 | 3 5  | 3 5469 | 3 65 | 3 525 | 2 8 |
| <b>31</b>      | 0 6 | 4 51797 | 1 1  | 0 955 | 0 94 | 4 5469 | 4 65 | 4 5 5 | 3 8 |
| <b>Aug 1</b>   | 6   | 5 51797 | 0 1  | 1 955 | 1 94 | 5 5469 | 5 65 | 5 525 | 4 8 |
| <b>2</b>       | 0 6 | 6 51797 | 3 01 | 955   | 94   | 6 5469 | 6 65 | 6 5 5 | 5 8 |
| <b>3</b>       | 0 6 | 0 36342 | 43   | 0 378 | 0 37 | 0 3933 | 0 50 | 0 371 | 6 8 |
| <b>4</b>       | 0 6 | 1 3634  | 1 43 | 1 378 | 1 37 | 1 3933 | 1 50 | 1 371 | 0 7 |
| <b>5</b>       | 6   | 2 3634  | 43   | 378   | 2 37 | 2 3933 | 50   | 371   | 1 7 |
| <b>6</b>       | 0 6 | 3 36342 | 3 43 | 3 378 | 3 37 | 3 3933 | 3 50 | 3 371 | 2 7 |
| <b>7</b>       | 0 6 | 4 36342 | 0 86 | 0 801 | 0 79 | 4 3933 | 4 50 | 4 371 | 3 7 |
| <b>8</b>       | 0 6 | 5 3634  | 1 86 | 1 801 | 1 79 | 5 3933 | 5 50 | 5 371 | 4 7 |
| <b>9</b>       | 6   | 6 36342 | 2 86 | 801   | 2 79 | 6 3933 | 6 50 | 6 371 | 5 7 |
| <b>10</b>      | 0 6 | 0 0886  | 0 8  | 0 4   | 0 1  | 0 2398 | 0 35 | 0 17  | 6 7 |
| <b>11</b>      | 6   | 1 886   | 1 28 | 1 4   | 1 21 | 1 2398 | 1 35 | 1 17  | 0 5 |
| <b>12</b>      | 0 6 | 2 0886  | 8    | 2 4   | 21   | 2 398  | 2 35 | 2 17  | 1 5 |
| <b>13</b>      | 0 6 | 3 886   | 3 8  | 3 24  | 3 1  | 3 2398 | 3 35 | 3 217 | 5   |
| <b>14</b>      | 0 6 | 4 0886  | 0 7  | 0 647 | 0 64 | 4 2398 | 4 35 | 4 217 | 3 5 |
| <b>15</b>      | 0 6 | 5 0886  | 1 70 | 1 647 | 1 64 | 5 398  | 5 35 | 5 217 | 4 5 |
| <b>16</b>      | 0 6 | 6 886   | 2 70 | 2 647 | 64   | 6 2398 | 6 35 | 6 217 | 5 5 |
| <b>17</b>      | 0 6 | 0 05431 | 0 13 | 0 070 | 0 06 | 0 0862 | 0 20 | 0 062 | 6 5 |
| <b>18</b>      | 0 6 | 1 05431 | 1 13 | 1 070 | 1 06 | 1 0862 | 1 20 | 1 062 | 0 3 |
| <b>19</b>      | 6   | 2 05431 | 13   | 2 070 | 06   | 2 0862 | 2 20 | 2 06  | 1 3 |
| <b>20</b>      | 0 6 | 3 05431 | 3 13 | 3 070 | 3 06 | 3 0862 | 3 20 | 3 06  | 2 3 |
| <b>21</b>      | 0 6 | 4 05431 | 0 55 | 0 493 | 0 48 | 4 0862 | 4 20 | 4 062 | 3 3 |
| <b>22</b>      | 0 6 | 5 05431 | 1 55 | 1 493 | 1 48 | 5 0862 | 5 20 | 5 062 | 4 3 |
| <b>23</b>      | 0 6 | 6 05431 | 55   | 493   | 2 48 | 6 0862 | 6 20 | 6 06  | 5 3 |
| <b>24</b>      | 0 6 | 7 05431 | 3 55 | 3 493 | 3 48 | 7 0862 | 0 05 | 7 062 | 6 3 |
| <b>25</b>      | 6   | 0 89976 | 0 98 | 0 916 | 0 90 | 0 93 7 | 1 05 | 0 908 | 0 1 |
| <b>26</b>      | 0 7 | 1 89976 | 1 98 | 1 916 | 1 90 | 1 93 7 | 2 05 | 1 908 | 1 1 |
| <b>27</b>      | 7   | 2 89976 | 2 98 | 2 916 | 90   | 2 93 7 | 3 05 | 2 908 | 2 1 |
| <b>28</b>      | 0 7 | 3 89976 | 0 40 | 0 339 | 0 33 | 3 93 7 | 4 05 | 3 908 | 3 1 |
| <b>29</b>      | 0 7 | 4 89976 | 1 40 | 1 339 | 1 33 | 4 9327 | 5 05 | 4 908 | 4 1 |
| <b>30</b>      | 0 7 | 5 89976 | 2 40 | 2 339 | 33   | 5 9327 | 6 5  | 5 908 | 5 1 |
| <b>31</b>      | 0 7 | 6 89976 | 3 40 | 3 339 | 3 33 | 6 9327 | 7 05 | 6 908 | 6 1 |
| <b>Sept 1</b>  | 0 7 | 0 745 1 | 0 82 | 0 76  | 0 75 | 0 7791 | 0 90 | 0 754 | 7 1 |
| <b>2</b>       | 0 7 | 1 745 1 | 1 8  | 1 762 | 1 75 | 1 7791 | 1 90 | 1 754 | 0 9 |
| <b>3</b>       | 0 7 | 745 1   | 2 82 | 76    | 2 75 | 2 7791 | 2 90 | 2 754 | 1 9 |
| <b>4</b>       | 0 7 | 3 74521 | 0 25 | 0 185 | 0 17 | 3 7791 | 3 90 | 3 754 | 2 9 |
| <b>5</b>       | 0 7 | 4 74521 | 1 25 | 1 185 | 1 17 | 4 7791 | 4 90 | 4 754 | 3 9 |
| <b>6</b>       | 7   | 5 745 1 | 25   | 185   | 17   | 5 7791 | 5 90 | 5 754 | 4 9 |
| <b>7</b>       | 7   | 6 745 1 | 3 5  | 3 185 | 3 17 | 6 7791 | 6 90 | 6 754 | 5 9 |
| <b>8</b>       | 0 7 | 0 59065 | 0 67 | 0 608 | 0 6  | 0 6 56 | 0 75 | 0 600 | 6 9 |
| <b>9</b>       | 0 7 | 1 59065 | 1 67 | 1 608 | 1 60 | 1 6 56 | 1 75 | 1 6 0 | 0 8 |
| <b>10</b>      | 0 7 | 59065   | 67   | 608   | 2 60 | 6256   | 75   | 2 600 | 1 8 |
| <b>11</b>      | 0 7 | 3 59 65 | 0 10 | 0 031 | 0 02 | 3 6 56 | 3 75 | 3 600 | 2 8 |
| <b>12</b>      | 0 7 | 4 59065 | 1 10 | 1 031 | 1 0  | 4 6256 | 4 75 | 4 600 | 3 8 |
| <b>13</b>      | 0 7 | 5 59065 | 2 1  | 0 31  | 0 2  | 5 6256 | 5 75 | 5 600 | 4 8 |
| <b>14</b>      | 0 7 | 6 59065 | 3 10 | 3 31  | 3 02 | 6 6 56 | 6 75 | 6 600 | 5 8 |
| <b>15</b>      | 0 7 | 0 43610 | 0 5  | 0 454 | 0 44 | 0 4720 | 0 60 | 0 445 | 6 8 |
| <b>16</b>      | 0 7 | 1 43610 | 1 5  | 1 454 | 1 44 | 1 4720 | 1 60 | 1 445 | 0 6 |
| <b>17</b>      | 0 7 | 43610   | 2 5  | 2 454 | 2 44 | 47 0   | 2 60 | 2 445 | 1 6 |
| <b>18</b>      | 0 7 | 3 43610 | 3 52 | 3 454 | 3 44 | 3 47 0 | 3 60 | 3 445 | 2 6 |
| <b>19</b>      | 0 7 | 4 43610 | 0 94 | 0 877 | 0 86 | 4 4720 | 4 60 | 4 445 | 3 6 |



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Motions of Mean Longitude and the Arguments for Days

| 1               | 2          | 3       | 4      | 5    | 6      | 7      | 8    | 9    | 10   | 11    | 12          |
|-----------------|------------|---------|--------|------|--------|--------|------|------|------|-------|-------------|
| Day             | Mean Long. | A       | B      | C    | D      | E      | F    | G    | H    | I     | J— $\alpha$ |
|                 | °          | d       | d      | d    | d      | d      | d    | d    | d    | d     | d           |
| <b>Sept. 20</b> | 273°54097  | 2°11570 | 0°012  | 5°19 | 5°4007 | 5°4266 | 5°87 | 5°85 | 4°62 | 12°21 | 263°00      |
| <b>21</b>       | 323°85862  | 3°11570 | 1°012  | 6°19 | 6°4007 | 6°4266 | 6°87 | 6°85 | 5°62 | 13°21 | 264°00      |
| <b>22</b>       | 14°17627   | 4°11570 | 2°012  | 0°03 | 0°2452 | 0°2718 | 0°93 | 0°90 | 6°62 | 14°21 | 265°00      |
| <b>23</b>       | 64°49391   | 5°11570 | 3°012  | 1°03 | 1°2452 | 1°2718 | 1°93 | 1°90 | 0°44 | 15°21 | 266°00      |
| <b>24</b>       | 114°81156  | 6°11570 | 4°012  | 2°03 | 2°2452 | 2°2718 | 2°93 | 2°90 | 1°44 | 16°21 | 267°00      |
| <b>25</b>       | 165°12921  | 0°06477 | 5°012  | 3°03 | 3°2452 | 3°2718 | 3°93 | 3°90 | 2°44 | 17°21 | 268°00      |
| <b>26</b>       | 215°44685  | 1°06477 | 6°012  | 4°03 | 4°2452 | 4°2718 | 4°93 | 4°90 | 3°44 | 18°21 | 269°00      |
| <b>27</b>       | 265°76450  | 2°06477 | 7°012  | 5°03 | 5°2452 | 5°2718 | 5°93 | 5°90 | 4°44 | 19°21 | 270°00      |
| <b>28</b>       | 316°08214  | 3°06477 | 8°012  | 6°03 | 6°2452 | 6°2718 | 6°93 | 6°90 | 5°44 | 20°21 | 271°00      |
| <b>29</b>       | 6°39979    | 4°06477 | 9°012  | 7°03 | 0°0896 | 0°1169 | 0°98 | 0°95 | 6°44 | 21°21 | 272°00      |
| <b>Oct. 30</b>  | 56°71744   | 5°06477 | 10°012 | 0°87 | 1°0896 | 1°1169 | 1°98 | 1°95 | 0°26 | 22°21 | 273°00      |
| <b>1</b>        | 107°03508  | 6°06477 | 11°012 | 1°87 | 2°0896 | 2°1169 | 2°98 | 2°95 | 1°26 | 23°21 | 274°00      |
| <b>2</b>        | 157°35273  | 0°01384 | 12°012 | 2°87 | 3°0896 | 3°1169 | 3°98 | 3°95 | 2°26 | 24°21 | 275°00      |
| <b>3</b>        | 207°67038  | 1°01384 | 0°489  | 3°87 | 4°0896 | 4°1169 | 4°98 | 4°95 | 3°26 | 25°21 | 276°00      |
| <b>4</b>        | 257°98802  | 2°01384 | 1°489  | 4°87 | 5°0896 | 5°1169 | 5°98 | 5°95 | 4°26 | 26°21 | 277°00      |
| <b>5</b>        | 308°30567  | 3°01384 | 2°489  | 5°87 | 6°0896 | 6°1169 | 0°03 | 0°00 | 5°26 | 27°21 | 278°00      |
| <b>6</b>        | 358°62331  | 4°01384 | 3°489  | 6°87 | 7°0896 | 7°1169 | 1°03 | 1°00 | 6°26 | 28°21 | 279°00      |
| <b>7</b>        | 48°94096   | 5°01384 | 4°489  | 0°71 | 0°9341 | 0°9621 | 2°03 | 2°00 | 0°09 | 29°21 | 280°00      |
| <b>8</b>        | 99°25861   | 6°01384 | 5°489  | 1°71 | 1°9341 | 1°9621 | 3°03 | 3°00 | 1°09 | 30°21 | 281°00      |
| <b>9</b>        | 149°57625  | 7°01384 | 6°489  | 2°71 | 2°9341 | 2°9621 | 4°03 | 4°00 | 2°09 | 31°21 | 282°00      |
| <b>10</b>       | 199°89390  | 0°96291 | 7°489  | 3°71 | 3°9341 | 3°9621 | 5°03 | 5°00 | 3°09 | 32°21 | 283°00      |
| <b>11</b>       | 250°21155  | 1°96291 | 8°489  | 4°71 | 4°9341 | 4°9621 | 6°03 | 6°00 | 4°09 | 33°21 | 284°00      |
| <b>12</b>       | 300°52919  | 2°96291 | 9°489  | 5°71 | 5°9341 | 5°9621 | 0°08 | 0°05 | 5°09 | 34°21 | 285°00      |
| <b>13</b>       | 350°84684  | 3°96291 | 10°489 | 6°71 | 6°9341 | 6°9621 | 1°08 | 1°05 | 6°09 | 35°21 | 286°00      |
| <b>14</b>       | 41°16449   | 4°96291 | 11°489 | 0°55 | 0°7786 | 0°8073 | 2°08 | 2°05 | 7°09 | 36°21 | 287°00      |
| <b>15</b>       | 91°48213   | 5°96291 | 12°489 | 1°55 | 1°7786 | 1°8073 | 3°08 | 3°05 | 0°91 | 37°21 | 288°00      |
| <b>16</b>       | 141°79978  | 6°96291 | 0°965  | 2°55 | 2°7786 | 2°8073 | 4°08 | 4°05 | 1°91 | 38°21 | 289°00      |
| <b>17</b>       | 192°11742  | 0°91199 | 1°965  | 3°55 | 3°7786 | 3°8073 | 5°08 | 5°05 | 2°91 | 39°21 | 290°00      |
| <b>18</b>       | 242°43507  | 1°91199 | 2°965  | 4°55 | 4°7786 | 4°8073 | 6°08 | 6°05 | 3°91 | 40°21 | 291°00      |
| <b>19</b>       | 292°75272  | 2°91199 | 3°965  | 5°55 | 5°7786 | 5°8073 | 0°13 | 0°10 | 4°91 | 41°21 | 292°00      |
| <b>20</b>       | 343°07036  | 3°91199 | 4°965  | 6°55 | 6°7786 | 6°8073 | 1°13 | 1°10 | 5°91 | 42°21 | 293°00      |
| <b>21</b>       | 33°38801   | 4°91199 | 5°965  | 0°39 | 0°6230 | 0°6525 | 2°13 | 2°10 | 6°91 | 43°21 | 294°00      |
| <b>22</b>       | 83°70566   | 5°91199 | 6°965  | 1°39 | 1°6230 | 1°6525 | 3°13 | 3°10 | 0°73 | 44°21 | 295°00      |
| <b>23</b>       | 134°02330  | 6°91199 | 7°965  | 2°39 | 2°6230 | 2°6525 | 4°13 | 4°10 | 1°73 | 45°21 | 296°00      |
| <b>24</b>       | 184°34095  | 0°86106 | 8°965  | 3°39 | 3°6230 | 3°6525 | 5°13 | 5°10 | 2°73 | 46°21 | 297°00      |
| <b>25</b>       | 234°65859  | 1°86106 | 9°965  | 4°39 | 4°6230 | 4°6525 | 6°13 | 6°10 | 3°73 | 47°21 | 298°00      |
| <b>26</b>       | 284°97624  | 2°86106 | 10°965 | 5°39 | 5°6230 | 5°6525 | 0°18 | 0°15 | 4°73 | 48°21 | 299°00      |
| <b>27</b>       | 335°29389  | 3°86106 | 11°965 | 6°39 | 6°6230 | 6°6525 | 1°18 | 1°15 | 5°73 | 49°21 | 300°00      |
| <b>28</b>       | 25°61153   | 4°86106 | 0°442  | 0°23 | 0°4675 | 0°4977 | 2°18 | 2°15 | 6°73 | 0°05  | 301°00      |
| <b>29</b>       | 75°92918   | 5°86106 | 1°442  | 1°23 | 1°4675 | 1°4977 | 3°18 | 3°15 | 0°56 | 1°05  | 302°00      |
| <b>30</b>       | 126°24683  | 6°86106 | 2°442  | 2°23 | 2°4675 | 2°4977 | 4°18 | 4°15 | 1°56 | 2°05  | 303°00      |
| <b>31</b>       | 176°56447  | 0°81013 | 3°442  | 3°23 | 3°4675 | 3°4977 | 5°18 | 5°15 | 2°56 | 3°05  | 304°00      |
| <b>Nov. 1</b>   | 226°88212  | 1°81013 | 4°442  | 4°23 | 4°4675 | 4°4977 | 6°18 | 6°15 | 3°56 | 4°05  | 305°00      |
| <b>2</b>        | 277°19976  | 2°81013 | 5°442  | 5°23 | 5°4675 | 5°4977 | 0°23 | 0°20 | 4°56 | 5°05  | 306°00      |
| <b>3</b>        | 327°51741  | 3°81013 | 6°442  | 6°23 | 6°4675 | 6°4977 | 1°23 | 1°20 | 5°56 | 6°05  | 307°00      |
| <b>4</b>        | 17°83506   | 4°81013 | 7°442  | 0°07 | 0°3119 | 0°3429 | 2°23 | 2°20 | 6°56 | 7°05  | 308°00      |
| <b>5</b>        | 68°15270   | 5°81013 | 8°442  | 1°07 | 1°3119 | 1°3429 | 3°23 | 3°20 | 0°38 | 8°05  | 309°00      |
| <b>6</b>        | 118°47035  | 6°81013 | 9°442  | 2°07 | 2°3119 | 2°3429 | 4°23 | 4°20 | 1°38 | 9°05  | 310°00      |
| <b>7</b>        | 168°78800  | 0°75921 | 10°442 | 3°07 | 3°3119 | 3°3429 | 5°23 | 5°20 | 2°38 | 10°05 | 311°00      |
| <b>8</b>        | 219°10564  | 1°75921 | 11°442 | 4°07 | 4°3119 | 4°3429 | 6°23 | 6°20 | 3°38 | 11°05 | 312°00      |
| <b>9</b>        | 269°42329  | 2°75921 | 12°442 | 5°07 | 5°3119 | 5°3429 | 0°28 | 0°25 | 4°38 | 12°05 | 313°00      |
| <b>10</b>       | 319°74094  | 3°75921 | 0°919  | 6°07 | 6°3119 | 6°3429 | 1°28 | 1°25 | 5°38 | 13°05 | 314°00      |

In Leap Year diminish the date in Columns 1, 13, by 1 day after Feb. 28.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Motions of Mean Longitude and the Arguments for Days

| 3              | 4   | 5                      | 6    | 7     | 8                    | 9      |      |       |     |
|----------------|-----|------------------------|------|-------|----------------------|--------|------|-------|-----|
| Day            | N   | O                      | P    | Q     | R                    | S      | T    | U     | V   |
| <b>Sept 20</b> | 7   | <sup>d</sup><br>5 4361 | 1 94 | 1 877 | <sup>1</sup><br>1 86 | 5 47 0 | 5 60 | 5 445 | 4 6 |
| <b>21</b>      | 7   | 6 4361                 | 94   | 877   | 86                   | 6 47 0 | 6 60 | 6 445 | 5 6 |
| <b>22</b>      | 7   | 0 8155                 | 37   | 0 300 | 0 9                  | 0 3184 | 0 45 | 0 91  | 6 6 |
| <b>23</b>      | 0 7 | 1 8155                 | 1 37 | 1 3   | 1 29                 | 1 3184 | 1 45 | 1 91  | 0 4 |
| <b>24</b>      | 0 7 | 8155                   | 37   | 2 300 | 9                    | 3184   | 45   | 2 91  | 1 4 |
| <b>25</b>      | 0 7 | 3 8155                 | 3 37 | 3 300 | 3 29                 | 3 3184 | 3 45 | 3 91  | 2 4 |
| <b>26</b>      | 0 7 | 4 8155                 | 79   | 0 7 3 | 0 71                 | 4 3184 | 4 45 | 4 91  | 3 4 |
| <b>27</b>      | 0 7 | 5 8155                 | 1 79 | 1 7 3 | 1 71                 | 5 3184 | 5 45 | 5 91  | 4 4 |
| <b>28</b>      | 0 7 | 6 8155                 | 79   | 2 7 3 | 71                   | 6 3184 | 6 45 | 6 91  | 5 4 |
| <b>29</b>      | 0 7 | 0 1 699                | 0 2  | 0 146 | 0 13                 | 0 1649 | 0 30 | 0 137 | 6 4 |
| <b>30</b>      | 7   | 1 1 699                | 1    | 1 146 | 1 13                 | 1 1649 | 1 30 | 1 137 | 0 2 |
| <b>Oct 1</b>   | 0 8 | 1 699                  |      | 2 146 | 13                   | 2 1649 | 2 30 | 2 137 | 1   |
| <b>2</b>       | 0 8 | 3 1 699                | 3 2  | 3 146 | 3 13                 | 3 1649 | 3 30 | 3 137 | 2   |
| <b>3</b>       | 0 8 | 4 1 699                | 0 64 | 0 56  | 0 55                 | 4 1649 | 4 30 | 4 137 | 3 2 |
| <b>4</b>       | 0 8 | 5 1 699                | 1 64 | 1 569 | 1 55                 | 5 1649 | 5 30 | 5 137 | 4 2 |
| <b>5</b>       | 0 8 | 6 1 699                | 64   | 569   | 55                   | 6 1649 | 6 30 | 6 137 | 5 2 |
| <b>6</b>       | 0 8 | 7 1 699                | 0 06 | 3 569 | 3 55                 | 0 0113 | 0 15 | 7 137 | 6 2 |
| <b>7</b>       | 0 8 | 97244                  | 1 06 | 0 992 | 0 98                 | 1 0113 | 1 15 | 0 982 | 0 0 |
| <b>8</b>       | 0 8 | 1 97 44                | 2 06 | 1 99  | 1 98                 | 2 0113 | 2 15 | 1 982 | 1 0 |
| <b>9</b>       | 0 8 | 97 44                  | 3 06 | 992   | 2 98                 | 3 0113 | 3 15 | 982   | 2 0 |
| <b>10</b>      | 0 8 | 3 97 44                | 0 49 | 0 415 | 0 40                 | 4 113  | 4 15 | 3 98  | 3 0 |
| <b>11</b>      | 8   | 4 97 44                | 1 49 | 1 415 | 1 40                 | 5 0113 | 5 15 | 4 982 | 4 0 |
| <b>12</b>      | 8   | 5 97 44                | 49   | 2 415 | 2 40                 | 6 113  | 6 15 | 5 98  | 5 0 |
| <b>13</b>      | 0 8 | 6 97 44                | 3 49 | 3 415 | 3 4                  | 7 0113 | 0 00 | 6 982 | 6 0 |
| <b>14</b>      | 8   | 81789                  | 0 91 | 0 838 | 82                   | 0 8578 | 1 00 | 8 8   | 7 0 |
| <b>15</b>      | 0 8 | 1 81789                | 1 91 | 1 838 | 1 82                 | 1 8578 | 00   | 1 828 | 0 9 |
| <b>16</b>      | 0 8 | 2 81789                | 91   | 838   | 82                   | 8578   | 3 0  | 8 8   | 1 9 |
| <b>17</b>      | 8   | 3 81789                | 0 33 | 0 261 | 0 25                 | 3 8578 | 4 00 | 3 8 8 | 2 9 |
| <b>18</b>      | 8   | 4 8 789                | 1 33 | 1 61  | 1 25                 | 4 8578 | 5 00 | 4 8 8 | 3 9 |
| <b>19</b>      | 8   | 5 81789                | 33   | 61    | 2 25                 | 5 8578 | 6 00 | 5 828 | 4 9 |
| <b>20</b>      | 0 8 | 6 81789                | 3 33 | 3 261 | 3 25                 | 6 8578 | 7 0  | 6 828 | 5 9 |
| <b>21</b>      | 0 8 | 66334                  | 0 76 | 0 684 | 0 67                 | 0 7042 | 0 85 | 0 674 | 6 9 |
| <b>22</b>      | 0 8 | 1 66334                | 1 76 | 1 684 | 1 67                 | 1 7042 | 1 85 | 1 674 | 0 7 |
| <b>23</b>      | 0 8 | 66334                  | 76   | 684   | 2 67                 | 7042   | 2 85 | 2 674 | 1 7 |
| <b>24</b>      | 8   | 3 66334                | 0 18 | 0 107 | 0 9                  | 3 042  | 3 85 | 3 674 | 2 7 |
| <b>25</b>      | 0 8 | 4 66334                | 1 18 | 1 107 | 1 09                 | 4 7042 | 4 85 | 4 674 | 3 7 |
| <b>26</b>      | 0 8 | 5 66334                | 2 18 | 1 7   | 2 9                  | 5 7 42 | 5 85 | 5 674 | 4 7 |
| <b>27</b>      | 0 8 | 6 66334                | 3 18 | 3 1 7 | 3 09                 | 6 704  | 6 85 | 6 674 | 5 7 |
| <b>28</b>      | 8   | 5 878                  | 0 61 | 0 53  | 0 51                 | 5507   | 0 70 | 0 519 | 6 7 |
| <b>29</b>      | 0 8 | 1 50878                | 1 61 | 1 530 | 1 51                 | 1 5507 | 1 70 | 1 519 | 0 5 |
| <b>30</b>      | 8   | 5 878                  | 61   | 53    | 51                   | 2 5507 | 70   | 2 519 | 1 5 |
| <b>Nov 31</b>  | 0 8 | 3 50878                | 0 3  | 3 530 | 3 51                 | 3 5507 | 3 70 | 3 519 | 2 5 |
| <b>1</b>       | 8   | 4 50878                | 1 03 | 0 953 | 94                   | 4 55 7 | 4 70 | 4 519 | 3 5 |
| <b>2</b>       | 0 8 | 5 50878                | 2 3  | 1 953 | 1 94                 | 5 5507 | 5 70 | 5 519 | 4 5 |
| <b>3</b>       | 8   | 6 50878                | 3 03 | 953   | 2 94                 | 6 55 7 | 6 70 | 6 519 | 5 5 |
| <b>4</b>       | 0 8 | 0 35423                | 0 45 | 0 376 | 0 36                 | 0 3971 | 0 55 | 0 365 | 6 5 |
| <b>5</b>       | 0 8 | 1 35423                | 1 45 | 1 376 | 1 36                 | 1 3971 | 1 55 | 1 365 | 0 3 |
| <b>6</b>       | 0 8 | 2 354 3                | 45   | 2 376 | 36                   | 3971   | 2 55 | 365   | 1 3 |
| <b>7</b>       | 0 9 | 3 354 3                | 3 45 | 3 376 | 3 36                 | 3 3971 | 3 55 | 3 365 | 2 3 |
| <b>8</b>       | 0 9 | 4 354 3                | 0 88 | 0 799 | 0 78                 | 4 3971 | 4 55 | 4 365 | 3 3 |
| <b>9</b>       | 0 9 | 5 35423                | 1 88 | 1 799 | 1 78                 | 5 3971 | 5 55 | 5 365 | 4 3 |
| <b>10</b>      | 0 9 | 6 354 3                | 2 88 | 2 799 | 78                   | 6 3971 | 6 55 | 6 365 | 5 3 |

I L p Y d m l h t h d t C l m g b y d y f t F b 8

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued Motions of Mean Longitude and the Arguments for Days

| 1              | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           | 12           |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day            | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | I            | J— $\alpha$  |
|                | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>Nov. 11</b> | 10°05858     | 4°75921      | 1°919        | 7°07         | 0°1564       | 0°1880       | 2°28         | 2°25         | 6°38         | 14°05        | 315°00       |
| <b>12</b>      | 60°37623     | 5°75921      | 2°919        | 0°90         | 1°1564       | 1°1880       | 3°28         | 3°25         | 0°20         | 15°05        | 316°00       |
| <b>13</b>      | 110°69387    | 6°75921      | 3°919        | 1°90         | 2°1564       | 2°1880       | 4°28         | 4°25         | 1°20         | 16°05        | 317°00       |
| <b>14</b>      | 161°01152    | 0°70828      | 4°919        | 2°90         | 3°1564       | 3°1880       | 5°28         | 5°25         | 2°20         | 17°05        | 318°00       |
| <b>15</b>      | 211°32917    | 1°70828      | 5°919        | 3°90         | 4°1564       | 4°1880       | 6°28         | 6°25         | 3°20         | 18°05        | 319°00       |
| <b>16</b>      | 261°64681    | 2°70828      | 6°919        | 4°90         | 5°1564       | 5°1880       | 0°33         | 0°30         | 4°20         | 19°05        | 320°00       |
| <b>17</b>      | 311°96446    | 3°70828      | 7°919        | 5°90         | 6°1564       | 6°1880       | 1°33         | 1°30         | 5°20         | 20°05        | 321°00       |
| <b>18</b>      | 2°28211      | 4°70828      | 8°919        | 6°90         | 0°0009       | 0°0332       | 2°33         | 2°30         | 6°20         | 21°05        | 322°00       |
| <b>19</b>      | 52°59975     | 5°70828      | 9°919        | 0°74         | 1°0009       | 1°0332       | 3°33         | 3°30         | 0°02         | 22°05        | 323°00       |
| <b>20</b>      | 102°91740    | 6°70828      | 10°919       | 1°74         | 2°0009       | 2°0332       | 4°33         | 4°30         | 1°02         | 23°05        | 324°00       |
| <b>21</b>      | 153°23504    | 0°65735      | 11°919       | 2°74         | 3°0009       | 3°0332       | 5°33         | 5°30         | 2°02         | 24°05        | 325°00       |
| <b>22</b>      | 203°55269    | 1°65735      | 0°396        | 3°74         | 4°0009       | 4°0332       | 6°33         | 6°30         | 3°02         | 25°05        | 326°00       |
| <b>23</b>      | 253°87034    | 2°65735      | 1°396        | 4°74         | 5°0009       | 5°0332       | 0°38         | 0°35         | 4°02         | 26°05        | 327°00       |
| <b>24</b>      | 304°18798    | 3°65735      | 2°396        | 5°74         | 6°0009       | 6°0332       | 1°38         | 1°35         | 5°02         | 27°05        | 328°00       |
| <b>25</b>      | 354°50563    | 4°65735      | 3°396        | 6°74         | 7°0009       | 7°0332       | 2°38         | 2°35         | 6°02         | 28°05        | 329°00       |
| <b>26</b>      | 44°82328     | 5°65735      | 4°396        | 0°58         | 0°8453       | 0°8784       | 3°38         | 3°35         | 7°02         | 29°05        | 330°00       |
| <b>27</b>      | 95°14092     | 6°65735      | 5°396        | 1°58         | 1°8453       | 1°8784       | 4°38         | 4°35         | 0°85         | 30°05        | 331°00       |
| <b>28</b>      | 145°45857    | 0°60642      | 6°396        | 2°58         | 2°8453       | 2°8784       | 5°38         | 5°35         | 1°85         | 31°05        | 332°00       |
| <b>29</b>      | 195°77621    | 1°60642      | 7°396        | 3°58         | 3°8453       | 3°8784       | 6°38         | 6°35         | 2°85         | 32°05        | 333°00       |
| <b>30</b>      | 246°09386    | 2°60642      | 8°396        | 4°58         | 4°8453       | 4°8784       | 0°43         | 0°40         | 3°85         | 33°05        | 334°00       |
| <b>Dec. 1</b>  | 296°41151    | 3°60642      | 9°396        | 5°58         | 5°8453       | 5°8784       | 1°43         | 1°40         | 4°85         | 34°05        | 335°00       |
| <b>2</b>       | 346°72915    | 4°60642      | 10°396       | 6°58         | 6°8453       | 6°8784       | 2°43         | 2°40         | 5°85         | 35°05        | 336°00       |
| <b>3</b>       | 37°04680     | 5°60642      | 11°396       | 0°42         | 0°6898       | 0°7236       | 3°43         | 3°40         | 6°85         | 36°05        | 337°00       |
| <b>4</b>       | 87°36445     | 6°60642      | 12°396       | 1°42         | 1°6898       | 1°7236       | 4°43         | 4°40         | 0°67         | 37°05        | 338°00       |
| <b>5</b>       | 137°68210    | 0°55550      | 0°872        | 2°42         | 2°6898       | 2°7236       | 5°43         | 5°40         | 1°67         | 38°05        | 339°00       |
| <b>6</b>       | 187°99974    | 1°55550      | 1°872        | 3°42         | 3°6898       | 3°7236       | 6°43         | 6°40         | 2°67         | 39°05        | 340°00       |
| <b>7</b>       | 238°31738    | 2°55550      | 2°872        | 4°42         | 4°6898       | 4°7236       | 0°48         | 0°45         | 3°67         | 40°05        | 341°00       |
| <b>8</b>       | 288°63503    | 3°55550      | 3°872        | 5°42         | 5°6898       | 5°7236       | 1°48         | 1°45         | 4°67         | 41°05        | 342°00       |
| <b>9</b>       | 338°95268    | 4°55550      | 4°872        | 6°42         | 6°6898       | 6°7236       | 2°48         | 2°45         | 5°67         | 42°05        | 343°00       |
| <b>10</b>      | 29°27032     | 5°55550      | 5°872        | 0°26         | 0°5343       | 0°5688       | 3°48         | 3°45         | 6°67         | 43°05        | 344°00       |
| <b>11</b>      | 79°58797     | 6°55550      | 6°872        | 1°26         | 1°5343       | 1°5688       | 4°48         | 4°45         | 0°49         | 44°05        | 345°00       |
| <b>12</b>      | 129°90562    | 0°50457      | 7°872        | 2°26         | 2°5343       | 2°5688       | 5°48         | 5°45         | 1°49         | 45°05        | 346°00       |
| <b>13</b>      | 180°22326    | 1°50457      | 8°872        | 3°26         | 3°5343       | 3°5688       | 6°48         | 6°45         | 2°49         | 46°05        | 347°00       |
| <b>14</b>      | 230°54091    | 2°50457      | 9°872        | 4°26         | 4°5343       | 4°5688       | 0°53         | 0°50         | 3°49         | 47°05        | 348°00       |
| <b>15</b>      | 280°85856    | 3°50457      | 10°872       | 5°26         | 5°5343       | 5°5688       | 1°53         | 1°50         | 4°49         | 48°05        | 349°00       |
| <b>16</b>      | 331°17620    | 4°50457      | 11°872       | 6°26         | 6°5343       | 6°5688       | 2°53         | 2°50         | 5°49         | 49°05        | 350°00       |
| <b>17</b>      | 21°49385     | 5°50457      | 0°349        | 0°10         | 0°3787       | 0°4139       | 3°53         | 3°50         | 6°49         | 50°05        | 351°00       |
| <b>18</b>      | 71°81149     | 6°50457      | 1°349        | 1°10         | 1°3787       | 1°4139       | 4°53         | 4°50         | 0°31         | 0°89         | 352°00       |
| <b>19</b>      | 122°12914    | 0°45364      | 2°349        | 2°10         | 2°3787       | 2°4139       | 5°53         | 5°50         | 1°31         | 1°89         | 353°00       |
| <b>20</b>      | 172°44679    | 1°45364      | 3°349        | 3°10         | 3°3787       | 3°4139       | 6°53         | 6°50         | 2°31         | 2°89         | 354°00       |
| <b>21</b>      | 222°76443    | 2°45364      | 4°349        | 4°10         | 4°3787       | 4°4139       | 0°58         | 0°55         | 3°31         | 3°89         | 355°00       |
| <b>22</b>      | 273°08208    | 3°45364      | 5°349        | 5°10         | 5°3787       | 5°4139       | 1°58         | 1°55         | 4°31         | 4°89         | 356°00       |
| <b>23</b>      | 323°39973    | 4°45364      | 6°349        | 6°10         | 6°3787       | 6°4139       | 2°58         | 2°55         | 5°31         | 5°89         | 357°00       |
| <b>24</b>      | 13°71737     | 5°45364      | 7°349        | 7°10         | 0°2232       | 0°2591       | 3°58         | 3°55         | 6°31         | 6°89         | 358°00       |
| <b>25</b>      | 64°03502     | 6°45364      | 8°349        | 0°94         | 1°2232       | 1°2591       | 4°58         | 4°55         | 0°14         | 7°89         | 359°00       |
| <b>26</b>      | 114°35266    | 0°40272      | 9°349        | 1°94         | 2°2232       | 2°2591       | 5°58         | 5°55         | 1°14         | 8°89         | 360°00       |
| <b>27</b>      | 164°67031    | 1°40272      | 10°349       | 2°94         | 3°2232       | 3°2591       | 6°58         | 6°55         | 2°14         | 9°89         | 361°00       |
| <b>28</b>      | 214°98796    | 2°40272      | 11°349       | 3°94         | 4°2232       | 4°2591       | 0°63         | 0°60         | 3°14         | 10°89        | 362°00       |
| <b>29</b>      | 265°30560    | 3°40272      | 12°349       | 4°94         | 5°2232       | 5°2591       | 1°63         | 1°60         | 4°14         | 11°89        | 363°00       |
| <b>30</b>      | 315°62325    | 4°40272      | 0°826        | 5°94         | 6°2232       | 6°2591       | 2°63         | 2°60         | 5°14         | 12°89        | 364°00       |
| <b>31</b>      | 5°94090      | 5°40272      | 1°826        | 6°94         | 0°0677       | 0°1043       | 3°63         | 3°60         | 6°14         | 13°89        | 365°00       |
| <b>32</b>      | 56°25854     | 6°40272      | 2°826        | 0°78         | 1°0677       | 1°1043       | 4°63         | 4°60         | 7°14         | 14°89        | 366°00       |

In Leap Year diminish the date in Columns 1, 13, by 1 day after Feb. 28

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XII continued

Motions of Mean Longitude and the Arguments for Days

| 3             | 4   | 5       | 6    | 7     | 8    | 9      |      |       |     |
|---------------|-----|---------|------|-------|------|--------|------|-------|-----|
| D y           | N   | O       | P    | Q     | R    | S      | T    | U     | V   |
|               |     | d       |      |       | d    | d      |      |       |     |
| <b>Nov</b> 11 | 9   | 0 19968 | 0 30 | 0     | 21   | 435    | 0 40 | 0 211 | 6 3 |
| 12            | 9   | 1 19968 | 1 3  | 1     | 1 1  | 1 435  | 1 4  | 1 11  | 0   |
| 13            | 0 9 | 19968   | 3    |       | 1    | 435    | 4    | 2 11  | 1   |
| 14            | 0 9 | 3 19968 | 3 30 | 3     | 3 21 | 3 435  | 3 40 | 3 211 | 2   |
| 15            | 0 9 | 4 19968 | 0 73 | 0 645 | 63   | 4 435  | 4 40 | 4 211 | 3   |
| 16            | 0 9 | 5 19968 | 1 73 | 1 645 | 1 63 | 5 2435 | 5 40 | 5 11  | 4   |
| 17            | 9   | 6 19968 | 2 73 | 2 645 | 2 63 | 6 435  | 6 40 | 6 11  | 5 2 |
| 18            | 0 9 | 0 0451  | 0 15 | 0 068 | 0 05 | 0 0900 | 0 5  | 0 057 | 6   |
| 19            | 0 9 | 1 451   | 1 15 | 1 068 | 1 05 | 1 0900 | 1 25 | 1 057 | 0 0 |
| 20            | 0 9 | 2 04512 | 2 15 | 0 68  | 2 5  | 2 090  | 2 5  | 2 57  | 1 0 |
| 21            | 0 9 | 3 451   | 3 15 | 3 68  | 3 05 | 3 0900 | 3 25 | 3 057 | 2 0 |
| 22            | 0 9 | 4 4512  | 0 57 | 0 491 | 0 47 | 4 90   | 4 25 | 4 057 | 3 0 |
| 23            | 0 9 | 5 0451  | 1 57 | 1 491 | 1 47 | 5 9 0  | 5 5  | 5 57  | 4 0 |
| 24            | 9   | 6 451   | 57   | 2 491 | 47   | 6 0900 | 6 5  | 6 057 | 5 0 |
| 25            | 0 9 | 7 0451  | 0 00 | 3 491 | 3 47 | 7 09 0 | 0 10 | 7 57  | 6 0 |
| 26            | 0 9 | 89 57   | 1 0  | 0 914 | 0 90 | 0 9364 | 1 10 | 0 902 | 7 0 |
| 27            | 9   | 1 89057 | 0    | 1 914 | 1 90 | 1 9364 | 10   | 1 9   | 0 8 |
| 28            | 0 9 | 89 57   | 3 00 | 914   | 90   | 2 9364 | 3 10 | 2 9 2 | 1 8 |
| 29            | 9   | 3 89 57 | 0 4  | 0 336 | 0 3  | 3 9364 | 4 10 | 3 902 | 2 8 |
| 30            | 0 9 | 4 89 57 | 1 4  | 1 336 | 1 3  | 4 9364 | 5 10 | 4 902 | 3 8 |
| <b>Dec</b> 1  | 9   | 5 89057 | 42   | 336   | 32   | 5 9364 | 6 10 | 5 90  | 4 8 |
| 2             | 0 9 | 6 89057 | 3 42 | 3 336 | 3 32 | 6 9364 | 7 10 | 6 9 2 | 5 8 |
| 3             | 9   | 0 7360  | 0 85 | 0 759 | 74   | 0 78 9 | 0 95 | 0 748 | 6 8 |
| 4             | 0 9 | 1 73602 | 1 85 | 1 759 | 1 74 | 1 78 9 | 1 95 | 1 748 | 0 6 |
| 5             | 0 9 | 2 736   | 85   | 2 759 | 74   | 2 7829 | 2 95 | 2 748 | 1 6 |
| 6             | 0 9 | 3 736   | 0 7  | 0 182 | 0 16 | 3 78 9 | 3 95 | 3 748 | 2 6 |
| 7             | 9   | 4 736   | 1 7  | 1 18  | 1 16 | 4 78 9 | 4 95 | 4 748 | 3 6 |
| 8             | 0 9 | 5 7360  | 2 7  | 18    | 16   | 5 78 9 | 5 95 | 5 748 | 4 6 |
| 9             | 0 9 | 6 736   | 3 27 | 3 18  | 3 16 | 6 7829 | 6 95 | 6 748 | 5 6 |
| 10            | 0 9 | 58147   | 0 69 | 0 6 5 | 0 59 | 0 6 93 | 0 80 | 0 594 | 6 6 |
| 11            | 0 9 | 1 58147 | 1 69 | 1 605 | 1 59 | 1 6293 | 1 8  | 1 594 | 0 4 |
| 12            | 0 9 | 2 58147 | 69   | 2 605 | 59   | 6293   | 2 80 | 2 594 | 1 4 |
| 13            | 1 0 | 3 58147 | 1    | 0 8   | 0 01 | 3 6 93 | 3 80 | 3 594 | 4   |
| 14            | 1 0 | 4 58147 | 1 1  | 1 0 8 | 1 01 | 4 6293 | 4 80 | 4 594 | 3 4 |
| 15            | 1   | 5 58147 | 1    | 028   | 01   | 5 6 93 | 5 80 | 5 594 | 4 4 |
| 16            | 1 0 | 6 58147 | 3 1  | 3 028 | 3 01 | 6 6 93 | 6 80 | 6 594 | 5 4 |
| 17            | 1   | 4 691   | 0 54 | 451   | 0 43 | 0 4758 | 0 65 | 0 439 | 6 4 |
| 18            | 1   | 1 4 691 | 1 54 | 1 451 | 1 43 | 1 4758 | 1 65 | 1 439 | 0 3 |
| 19            | 1 0 | 4 691   | 54   | 451   | 43   | 2 4758 | 2 65 | 2 439 | 1 3 |
| 20            | 1 0 | 3 42691 | 3 54 | 3 451 | 3 43 | 3 4758 | 3 65 | 3 439 | 2 3 |
| 21            | 1 0 | 4 4 691 | 0 96 | 0 874 | 0 86 | 4 4758 | 4 65 | 4 439 | 3 3 |
| 22            | 1 0 | 5 4 691 | 1 96 | 1 874 | 1 86 | 5 4758 | 5 65 | 5 439 | 4 3 |
| 23            | 1   | 6 4 691 | 96   | 874   | 2 86 | 6 4758 | 6 65 | 6 439 | 5 3 |
| 24            | 1   | 0 7 36  | 0 39 | 0 97  | 0 28 | 0 322  | 0 5  | 0 285 | 6 3 |
| 25            | 1 0 | 1 7 36  | 1 39 | 1 297 | 1 8  | 1 32 2 | 1 5  | 1 85  | 0 1 |
| 26            | 1 0 | 7 36    | 39   | 97    | 28   | 2 32   | 2 50 | 2 285 | 1 1 |
| 27            | 1   | 3 7 36  | 3 39 | 3 97  | 3 8  | 3 3 2  | 3 50 | 3 285 | 2 1 |
| 28            | 1   | 4 7 36  | 0 81 | 7 0   | 0 70 | 4 32   | 4 5  | 4 85  | 3 1 |
| 29            | 1 0 | 5 7 36  | 1 81 | 1 7   | 1 70 | 5 322  | 5 50 | 5 285 | 4 1 |
| 30            | 1 0 | 6 7 36  | 81   | 72    | 2 70 | 6 3 2  | 6 50 | 6 285 | 5 1 |
| 31            | 1 0 | 0 11781 | 4    | 143   | 0 12 | 0 1687 | 0 36 | 0 131 | 6 1 |
| 32            | 1 0 | 1 11781 | 1 4  | 1 143 | 1 1  | 1 1687 | 1 36 | 1 131 | 7 1 |

I L p Y d i m i n h t h d t i O l m by d y f t F b 8

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XIII

Motion of Mean Longitude for Parts of a Day

| 1    | 2          | 1    | 2          |
|------|------------|------|------------|
| Days | Mean Long. | Days | Mean Long. |
| d    | °          | d    | °          |
| 0.00 | 0.00000    | 0.50 | 25.15882   |
| .01  | 0.50318    | .51  | 25.66200   |
| .02  | 1.00635    | .52  | 26.16518   |
| .03  | 1.50953    | .53  | 26.66835   |
| .04  | 2.01271    | .54  | 27.17153   |
| .05  | 2.51588    | .55  | 27.67471   |
| 0.06 | 3.01906    | 0.56 | 28.17788   |
| .07  | 3.52224    | .57  | 28.68106   |
| .08  | 4.02541    | .58  | 29.18423   |
| .09  | 4.52859    | .59  | 29.68741   |
| .10  | 5.03176    | .60  | 30.19059   |
| 0.11 | 5.53494    | 0.61 | 30.69376   |
| .12  | 6.03812    | .62  | 31.19694   |
| .13  | 6.54129    | .63  | 31.70012   |
| .14  | 7.04447    | .64  | 32.20329   |
| .15  | 7.54765    | .65  | 32.70647   |
| 0.16 | 8.05082    | 0.66 | 33.20965   |
| .17  | 8.55400    | .67  | 33.71282   |
| .18  | 9.05718    | .68  | 34.21600   |
| .19  | 9.56035    | .69  | 34.71918   |
| .20  | 10.06353   | .70  | 35.22235   |
| 0.21 | 10.56671   | 0.71 | 35.72553   |
| .22  | 11.06988   | .72  | 36.22871   |
| .23  | 11.57306   | .73  | 36.73188   |
| .24  | 12.07624   | .74  | 37.23506   |
| .25  | 12.57941   | .75  | 37.73823   |
| 0.26 | 13.08259   | 0.76 | 38.24141   |
| .27  | 13.58576   | .77  | 38.74459   |
| .28  | 14.08894   | .78  | 39.24776   |
| .29  | 14.59212   | .79  | 39.75094   |
| .30  | 15.09529   | .80  | 40.25412   |
| 0.31 | 15.59847   | 0.81 | 40.75729   |
| .32  | 16.10165   | .82  | 41.26047   |
| .33  | 16.60482   | .83  | 41.76365   |
| .34  | 17.10800   | .84  | 42.26682   |
| .35  | 17.61118   | .85  | 42.77000   |
| 0.36 | 18.11435   | 0.86 | 43.27318   |
| .37  | 18.61753   | .87  | 43.77635   |
| .38  | 19.12071   | .88  | 44.27953   |
| .39  | 19.62388   | .89  | 44.78271   |
| .40  | 20.12706   | .90  | 45.28588   |
| 0.41 | 20.63023   | 0.91 | 45.78906   |
| .42  | 21.13341   | .92  | 46.29223   |
| .43  | 21.63659   | .93  | 46.79541   |
| .44  | 22.13976   | .94  | 47.29859   |
| .45  | 22.64294   | .95  | 47.80176   |
| 0.46 | 23.14612   | 0.96 | 48.30494   |
| .47  | 23.64929   | .97  | 48.80812   |
| .48  | 24.15247   | .98  | 49.31129   |
| .49  | 24.65565   | .99  | 49.81447   |
| .50  | 25.15882   | 1.00 | 50.31765   |

| 3      | 4          | 3      | 4          |
|--------|------------|--------|------------|
| Days   | Mean Long. | Days   | Mean Long. |
| d      | °          | d      | °          |
| 0.0000 | 0.00000    | 0.0050 | 0.25159    |
| 1      | 503        | 51     | .25662     |
| 2      | 1006       | 52     | .26165     |
| 3      | 1509       | 53     | .26668     |
| 4      | 2013       | 54     | .27172     |
| 5      | 2516       | 55     | .27675     |
| 0.0008 | 0.03019    | 0.0056 | 0.28178    |
| 7      | 3522       | 57     | .28681     |
| 8      | 4025       | 58     | .29184     |
| 9      | 4529       | 59     | .29687     |
| 10     | 5032       | 60     | .30191     |
| 0.0011 | 0.05535    | 0.0061 | 0.30694    |
| 12     | 6038       | 62     | .31197     |
| 13     | 6541       | 63     | .31700     |
| 14     | 7044       | 64     | .32203     |
| 15     | 7548       | 65     | .32706     |
| 0.0016 | 0.08051    | 0.0066 | 0.33210    |
| 17     | 8554       | 67     | .33713     |
| 18     | 9057       | 68     | .34216     |
| 19     | 9560       | 69     | .34719     |
| 20     | 10064      | 70     | .35222     |
| 0.0021 | 0.10567    | 0.0071 | 0.35726    |
| 22     | 11070      | 72     | .36229     |
| 23     | 11573      | 73     | .36732     |
| 24     | 12076      | 74     | .37235     |
| 25     | 12579      | 75     | .37738     |
| 0.0026 | 0.13083    | 0.0076 | 0.38241    |
| 27     | 13586      | 77     | .38745     |
| 28     | 14089      | 78     | .39248     |
| 29     | 14592      | 79     | .39751     |
| 30     | 15095      | 80     | .40254     |
| 0.0031 | 0.15598    | 0.0081 | 0.40757    |
| 32     | 16102      | 82     | .41260     |
| 33     | 16605      | 83     | .41764     |
| 34     | 17108      | 84     | .42267     |
| 35     | 17611      | 85     | .42770     |
| 0.0036 | 0.18114    | 0.0086 | 0.43273    |
| 37     | 18618      | 87     | .43776     |
| 38     | 19121      | 88     | .44280     |
| 39     | 19624      | 89     | .44783     |
| 40     | 20127      | 90     | .45286     |
| 0.0041 | 0.20630    | 0.0091 | 0.45789    |
| 42     | 21133      | 92     | .46292     |
| 43     | 21637      | 93     | .46795     |
| 44     | 22140      | 94     | .47299     |
| 45     | 22643      | 95     | .47802     |
| 0.0046 | 0.23146    | 0.0096 | 0.48305    |
| 47     | 23649      | 97     | .48808     |
| 48     | 24152      | 98     | .49311     |
| 49     | 24656      | 99     | .49814     |
| 50     | 0.25159    | 0.0100 | 0.50318    |

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XIV

Equation of Longitude

Argument A

| A    | Equation | 3        |                        | A    | Equation | 3        |                        | A    | Equation | 3        |                        | A    | Equation | 3        |                        |
|------|----------|----------|------------------------|------|----------|----------|------------------------|------|----------|----------|------------------------|------|----------|----------|------------------------|
|      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |
| 0 00 | 0 07000  | - 67 0   | 0 0                    | 2 00 | 0 00396  | + 1 8    | + 0 4                  | 4 00 | 0 09857  | + 55 8   | - 1                    | 6 00 | 1 690    | - 33 0   | - 0 2                  |
| 04   | 6731     | 66 8     | 0                      | 04   | 449      | 14 5     | 3                      | 04   | 10078    | 54 8     | 1                      | 04   | 1 555    | 34 5     | 0 2                    |
| 08   | 6463     | 66 8     | + 1                    | 08   | 511      | 16 3     | 0 1                    | 08   | 10 95    | 53 5     | 0                      | 08   | 12412    | 36 8     | 0 1                    |
| 12   | 6196     | 66 8     | + 0 1                  | 12   | 580      | 18 3     | 0 1                    | 12   | 105 6    | 5 5      | 0 0                    | 12   | 1 262    | 38 5     | 2                      |
| 16   | 5931     | 66       | 0 0                    | 16   | 656      | 20 0     | 0                      | 16   | 1 713    | 51 0     | - 0                    | 16   | 12104    | 40 5     | 0 3                    |
| 20   | 5667     | 65 5     | + 0                    | 20   | 74       | 1 8      | 0 1                    | 20   | 10914    | 49 5     | - 0                    | 20   | 11939    | 42 3     | 0 4                    |
| 0 24 | 0 54 7   | - 65 0   | + 0 1                  | 2 24 | 0 0830   | + 23 5   | + 0                    | 4 24 | 0 11108  | + 48 0   | 0 0                    | 6 24 | 0 11766  | - 44 0   | - 0 2                  |
| 28   | 5150     | 63 9     | 0 1                    | 28   | 9 8      | 25 3     | 1                      | 28   | 11 98    | 46 5     | - 0                    | 28   | 11586    | 46 0     | 0 2                    |
| 32   | 4897     | 63       | 0 1                    | 32   | 1033     | 27 3     | 0 1                    | 32   | 11481    | 45 0     | 0 3                    | 32   | 11399    | 47 8     | 0 4                    |
| 36   | 4648     | 61 8     | 1                      | 36   | 1145     | 29 0     | 0 2                    | 36   | 11657    | 43 0     | 0                      | 36   | 11 04    | 49 3     | 0 1                    |
| 40   | 4403     | 60 5     | 0                      | 40   | 1 64     | 30 5     | + 0 2                  | 40   | 118 7    | 4 0      | 3                      | 40   | 11 03    | 51 3     | 0 1                    |
| 0 44 | 0 04164  | - 59 3   | + 1                    | 2 44 | 0 01391  | + 32 5   | 0                      | 4 44 | 0 11990  | + 39 8   | - 0 1                  | 6 44 | 0 10796  | - 52 8   | - 0 4                  |
| 48   | 3930     | 58       |                        | 48   | 15 4     | 34 3     | + 0 1                  | 48   | 1 146    | 38 3     | 0 1                    | 48   | 1 581    | 54 5     | 3                      |
| 52   | 3701     | 56 3     | + 1                    | 52   | 1665     | 36       | 0 0                    | 52   | 1 296    | 37 0     | 0 5                    | 52   | 10360    | 55 8     | - 0 1                  |
| 56   | 3479     | 54 8     | 1                      | 56   | 181      | 37 8     | + 0 1                  | 56   | 1 438    | 34 8     | 0 1                    | 56   | 10133    | 57 5     | 0 0                    |
| 60   | 3 63     | 53 3     | 0 1                    | 60   | 1966     | 39 5     | 0                      | 60   | 12574    | 33 0     | 0                      | 60   | 9901     | 59 0     | - 0 2                  |
| 0 64 | 0 03053  | - 51 8   | + 0 1                  | 2 64 | 0 0 1 8  | + 41 3   | + 0 1                  | 4 64 | 0 1 702  | + 31 0   | - 0 2                  | 6 64 | 0 09663  | - 60     | - 0 2                  |
| 68   | 850      | 50       | 0 1                    | 68   | 2296     | 4 8      | + 1                    | 68   | 1 8 3    | 9 5      | 0                      | 68   | 9419     | 61 5     | 0 0                    |
| 72   | 653      | 48       | 0 4                    | 72   | 2471     | 44 5     | 0                      | 72   | 1 937    | 7 8      | - 0 1                  | 72   | 917      | 62 5     | - 0 2                  |
| 76   | 2464     | 46 8     | 0 4                    | 76   | 65       | 46 3     | + 0 1                  | 76   | 13044    | 26 0     | 0 0                    | 76   | 8919     | 63 5     | 0 0                    |
| 80   | 2 8      | 44 5     | 3                      | 80   | 839      | 47 0     |                        | 80   | 13144    | 23 8     | - 0 1                  | 80   | 8663     | 64 5     | 0 0                    |
| 0 84 | 0 0 108  | - 4 8    | + 0 1                  | 2 84 | 0 0303   | + 49 0   | +                      | 4 84 | 0 13 36  | + 22 3   | - 0 1                  | 6 84 | 0 08404  | - 65 3   | - 0 1                  |
| 88   | 1940     | 41 0     | 0 3                    | 88   | 3 32     | 50 5     | 0                      | 88   | 133      | 0 5      | 0                      | 88   | 814      | 65 8     | - 0 1                  |
| 92   | 1780     | 39 0     | 0 3                    | 92   | 3437     | 52 0     | 0                      | 92   | 13400    | 18 8     | 0 1                    | 92   | 7877     | 66 5     | 0 0                    |
| 96   | 16 8     | 37 0     | 3                      | 96   | 3647     | 53 3     | + 1                    | 96   | 13471    | 16 8     | 0 1                    | 96   | 7610     | 67 0     | 0 0                    |
| 1 00 | 1483     | 35 3     | 0 4                    | 3 00 | 386      | 54 3     | 0 1                    | 5 00 | 13535    | 15 0     | 0                      | 7 00 | 7342     | 67 0     | 0                      |
| 1 04 | 0 1346   | - 33 5   | + 0 3                  | 3 04 | 0 0408   | + 55 8   | + 1                    | 5 04 | 0 1359   | + 13 3   | - 0 4                  | 7 04 | 0 07073  | - 67 3   | + 0 1                  |
| 08   | 1217     | 31 3     | 0 1                    | 08   | 43 6     | 56 5     | + 0                    | 08   | 13641    | 11 5     | 0                      | 08   | 6804     | 67 3     | + 0 1                  |
| 12   | 1095     | 29 5     | 0 3                    | 12   | 4535     | 57 5     | 0 0                    | 12   | 13683    | 9 8      | 0 1                    | 12   | 6536     | 67 0     | 0 0                    |
| 16   | 98       | 7 3      | 0 1                    | 16   | 4767     | 58 8     | + 1                    | 16   | 13719    | 7 5      | 0 5                    | 16   | 6 69     | 66 5     | 0 0                    |
| 20   | 875      | 5 5      | 0 5                    | 20   | 5 03     | 59 3     | 0 1                    | 20   | 13746    | 6 3      | 0 4                    | 20   | 6003     | 66 3     | + 1                    |
| 1 24 | 0 0 778  | - 3 8    | + 1                    | 3 24 | 0 05241  | + 60 0   | + 0 2                  | 5 24 | 0 13766  | + 4 3    | - 1                    | 7 24 | 0 5739   | - 65 8   | + 0 1                  |
| 28   | 688      | 1 5      | 0 0                    | 28   | 5483     | 60 5     | 0                      | 28   | 13779    | 0        | 0                      | 28   | 5478     | 65 0     | 0 0                    |
| 32   | 6 5      | 19 5     | + 0                    | 32   | 57 6     | 61 3     | + 0 1                  | 32   | 13785    | + 0 8    | 0 4                    | 32   | 52 0     | 64 0     | 0                      |
| 36   | 531      | 17 5     | 0 3                    | 36   | 597      | 61 5     | 0                      | 36   | 13783    | - 1 5    | 0 3                    | 36   | 4966     | 63 0     | 0                      |
| 40   | 465      | 15 8     | 0 1                    | 40   | 62 9     | 62       |                        | 40   | 13773    | 3 5      | 0 3                    | 40   | 4715     | 62 0     | + 0                    |
| 1 44 | 0 004 6  | - 13 5   | + 2                    | 3 44 | 0 06467  | + 6 3    | + 0 1                  | 5 44 | 0 13755  | - 5 3    | - 0 3                  | 7 44 | 0 04469  | - 61 0   | + 0                    |
| 48   | 356      | 1 8      | 0 1                    | 48   | 6716     | 6 3      | + 0 1                  | 48   | 13731    | 7 3      | 0 4                    | 48   | 4 9      | 59 5     | 0 0                    |
| 52   | 313      | 9 8      | 0 1                    | 52   | 6966     | 6 5      | 0                      | 52   | 13698    | 9 3      | 0 4                    | 52   | 3993     | 58 3     | + 1                    |
| 56   | 78       | 7 8      | 0 1                    | 56   | 7 5      | 6 3      | + 1                    | 56   | 13657    | 11       | 0 3                    | 56   | 3763     | 56 8     | 1                      |
| 60   | 5        | 5 8      | 4                      | 60   | 7465     | 62 3     | - 0 1                  | 60   | 13609    | 13 3     | 0 4                    | 60   | 3539     | 55 3     | 0 1                    |
| 1 64 | 0 00 31  | - 4 0    | + 0 3                  | 3 64 | 0 7713   | + 61 8   | - 0 1                  | 5 64 | 0 13552  | - 15 0   | - 0 3                  | 7 64 | 0 03321  | - 54 3   | + 0 1                  |
| 68   | 19       | 0        | 0 3                    | 68   | 7961     | 62       | - 0 2                  | 68   | 13488    | 17       | 0 3                    | 68   | 3109     | 52 0     | 0 2                    |
| 72   | 215      | 0        | 0 3                    | 72   | 8 7      | 61 5     | 0 0                    | 72   | 13416    | 19 0     | 3                      | 72   | 905      | 5 3      | 0 1                    |
| 76   | 18       | + 1 8    | 4                      | 76   | 8451     | 60 8     | - 1                    | 76   | 13336    | 20 5     | 0 5                    | 76   | 2707     | 48 8     | 0 1                    |
| 80   | 2 9      | 3 8      | 0 4                    | 80   | 8693     | 60 3     | - 1                    | 80   | 13 48    | 23       | 0                      | 80   | 2515     | 47 0     | 0                      |
| 1 84 | 0 0 248  | + 5 5    | + 0 3                  | 3 84 | 0 0893   | + 59 5   | 0 0                    | 5 84 | 0 13152  | - 5 0    | - 0 2                  | 7 84 | 0 02331  | - 45 0   | + 0 2                  |
| 88   | 73       | 7 3      | 4                      | 88   | 9170     | 58 8     | - 4                    | 88   | 13048    | 6 8      | 1                      | 88   | 155      | 43 3     | 0 1                    |
| 92   | 306      | 9 3      | 0 4                    | 92   | 9402     | 57 8     | 1                      | 92   | 1 937    | 9        | 0                      | 92   | 1985     | 41 5     | 0                      |
| 96   | 347      | 11 0     | 0 3                    | 96   | 963      | 57 0     |                        | 96   | 1 817    | 3 8      | 0 1                    | 96   | 1823     | 39 5     | 0                      |
| 2 00 | 0 396    | + 1 8    | + 0 4                  | 4 00 | 0 9857   | + 55 8   | - 0 1                  | 6 00 | 0 12690  | - 33 0   | - 0                    | 8 00 | 0 01669  | - 37 5   | + 0                    |

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XV

Equations of Longitude

| 1        | 2             | 3        | 4                     | 1        | 2             | 3        | 4                     | 1         | 2             | 3        | 4                     |
|----------|---------------|----------|-----------------------|----------|---------------|----------|-----------------------|-----------|---------------|----------|-----------------------|
| B        | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | B        | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ | B         | Equa-<br>tion | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| d<br>0.0 | 0.02000       | + 148    | 0                     | d<br>5.0 | 0.00430       | + 64     | + 7                   | d<br>10.0 | 0.01654       | - 136    | + 3                   |
| .1       | 2148          | 147      | - 1                   | .1       | 501           | 77       | 6                     | .1        | 1521          | 130      | 3                     |
| .2       | 2293          | 143      | 2                     | .2       | 584           | 89       | 6                     | .2        | 1394          | 123      | 4                     |
| .3       | 2434          | 138      | 3                     | .3       | 679           | 101      | 6                     | .3        | 1275          | 115      | 5                     |
| .4       | 2569          | 131      | 4                     | .4       | 785           | 111      | 5                     | .4        | 1165          | 105      | 5                     |
| .5       | 2696          | 123      | 5                     | .5       | 901           | 121      | 5                     | .5        | 1065          | 94       | 6                     |
| 0.6      | 0.02814       | + 112    | - 6                   | 5.6      | 0.01026       | + 129    | + 4                   | 10.6      | 0.00977       | - 82     | + 6                   |
| .7       | 2920          | 100      | 6                     | .7       | 1159          | 137      | 4                     | .7        | 901           | 70       | 7                     |
| .8       | 3014          | 87       | 7                     | .8       | 1299          | 143      | 3                     | .8        | 838           | 56       | 7                     |
| .9       | 3094          | 73       | 7                     | .9       | 1445          | 148      | 2                     | .9        | 789           | 41       | 8                     |
| 1.0      | 3160          | 58       | 8                     | 6.0      | 1595          | 152      | 2                     | 11.0      | 756           | 26       | 8                     |
| 1.1      | 0.03210       | + 42     | - 8                   | 6.1      | 0.01748       | + 154    | + 1                   | 11.1      | 0.00738       | - 10     | + 8                   |
| .2       | 3244          | 26       | 8                     | .2       | 1903          | 156      | + 1                   | .2        | 736           | + 7      | 9                     |
| .3       | 3262          | + 10     | 8                     | .3       | 2060          | 157      | - 1                   | .3        | 751           | 23       | 8                     |
| .4       | 3264          | - 7      | 9                     | .4       | 2216          | 155      | 1                     | .4        | 781           | 38       | 8                     |
| .5       | 3249          | 23       | 8                     | .5       | 2370          | 153      | 2                     | .5        | 827           | 54       | 8                     |
| 1.6      | 0.03219       | - 38     | - 8                   | 6.6      | 0.02521       | + 149    | - 2                   | 11.6      | 0.00889       | + 70     | + 8                   |
| .7       | 3174          | 52       | 7                     | .7       | 2668          | 144      | 3                     | .7        | 966           | 84       | 7                     |
| .8       | 3115          | 66       | 7                     | .8       | 2809          | 138      | 4                     | .8        | 1057          | 97       | 6                     |
| .9       | 3042          | 80       | 7                     | .9       | 2943          | 131      | 4                     | .9        | 1160          | 109      | 6                     |
| 2.0      | 2956          | 92       | 6                     | 7.0      | 3070          | 123      | 4                     | 12.0      | 1275          | 120      | 5                     |
| 2.1      | 0.02859       | - 103    | - 6                   | 7.1      | 0.03189       | + 114    | - 5                   | 12.1      | 0.01400       | + 130    | + 5                   |
| .2       | 2751          | 113      | 5                     | .2       | 3297          | 103      | 6                     | .2        | 1534          | 137      | 3                     |
| .3       | 2634          | 121      | 4                     | .3       | 3394          | 92       | 6                     | .3        | 1674          | 143      | 3                     |
| .4       | 2509          | 129      | 3                     | .4       | 3480          | 80       | 6                     | .4        | 1819          | 146      | + 1                   |
| .5       | 2377          | 135      | 3                     | .5       | 3554          | 68       | 7                     | .5        | 1966          | 147      | 0                     |
| 2.6      | 0.02240       | - 139    | - 2                   | 7.6      | 0.03615       | + 54     | - 7                   | 12.6      | 0.02113       | + 147    | - 1                   |
| .7       | 2099          | 143      | 2                     | .7       | 3662          | 41       | 7                     | .7        | 2259          | 145      | 2                     |
| .8       | 1955          | 145      | - 1                   | .8       | 3696          | 27       | 8                     | .8        | 2402          | 140      | 3                     |
| .9       | 1809          | 146      | 0                     | .9       | 3715          | + 12     | 7                     | .9        | 2539          | 133      | 4                     |
| 3.0      | 1663          | 145      | + 1                   | 8.0      | 3720          | - 2      | 7                     | 13.0      | 2668          | 125      | 5                     |
| 3.1      | 0.01519       | - 143    | + 1                   | 8.1      | 0.03711       | - 16     | - 7                   | 13.1      | 0.02788       | + 115    | - 6                   |
| .2       | 1377          | 140      | 2                     | .2       | 3688          | 30       | 7                     | .2        | 2897          | 103      | 6                     |
| .3       | 1239          | 135      | 3                     | .3       | 3651          | 44       | 7                     | .3        | 2994          | 90       | 7                     |
| .4       | 1107          | 130      | 3                     | .4       | 3600          | 58       | 7                     | .4        | 3077          | 76       | 7                     |
| .5       | 980           | 123      | 4                     | .5       | 3536          | 70       | 6                     | .5        | 3146          | 61       | 8                     |
| 3.6      | 0.00861       | - 115    | + 5                   | 8.6      | 0.03460       | - 82     | - 6                   | 13.6      | 0.03199       | + 46     | - 8                   |
| .7       | 751           | 106      | 5                     | .7       | 3372          | 94       | 6                     | .7        | 3237          | 30       | 8                     |
| .8       | 650           | 96       | 6                     | .8       | 3273          | 104      | 5                     | .8        | 3259          | + 14     | 9                     |
| .9       | 560           | 85       | 6                     | .9       | 3165          | 113      | 5                     | .9        | 3264          | - 3      | 8                     |
| 4.0      | 481           | 73       | 7                     | 9.0      | 3048          | 121      | 4                     | 14.0      | 3254          | 18       | 8                     |
| 4.1      | 0.00414       | - 61     | + 7                   | 9.1      | 0.02923       | - 128    | - 3                   | 14.1      | 0.03228       | - 34     | - 8                   |
| .2       | 360           | 47       | 7                     | .2       | 2792          | 134      | 3                     | .2        | 3186          | 49       | 7                     |
| .3       | 320           | 34       | 7                     | .3       | 2655          | 139      | 2                     | .3        | 3130          | 63       | 7                     |
| .4       | 293           | 20       | 8                     | .4       | 2514          | 143      | 2                     | .4        | 3060          | 77       | 7                     |
| .5       | 281           | - 6      | 7                     | .5       | 2370          | 145      | 1                     | .5        | 2977          | 89       | 6                     |
| 4.6      | 0.00282       | + 9      | + 8                   | 9.6      | 0.02225       | - 146    | - 1                   | 14.6      | 0.02882       | - 100    | - 5                   |
| .7       | 298           | 24       | 8                     | .7       | 2079          | 145      | + 1                   | .7        | 2777          | 110      | 5                     |
| .8       | 329           | 38       | 7                     | .8       | 1935          | 143      | 1                     | .8        | 2662          | 119      | 4                     |
| .9       | 373           | 51       | 7                     | .9       | 1793          | 141      | 2                     | .9        | 2539          | 127      | 4                     |
| 5.0      | 0.00430       | + 64     | + 7                   | 10.0     | 0.01654       | - 136    | + 3                   | 15.0      | 0.02408       | - 135    | - 4                   |

XVI

| 1        | 2             |
|----------|---------------|
| C        | Equa-<br>tion |
| d<br>0.0 | 0.00050       |
| .2       | 45            |
| .4       | 40            |
| .6       | 35            |
| .8       | 31            |
| 1.0      | 27            |
| 1.2      | 0.00024       |
| .4       | 22            |
| .6       | 20            |
| .8       | 20            |
| 2.0      | 21            |
| 2.2      | 0.00022       |
| .4       | 24            |
| .6       | 27            |
| .8       | 31            |
| 3.0      | 35            |
| 3.2      | 0.00040       |
| .4       | 45            |
| .6       | 51            |
| .8       | 56            |
| 4.0      | 61            |
| 4.2      | 0.00066       |
| .4       | 70            |
| .6       | 73            |
| .8       | 76            |
| 5.0      | 79            |
| 5.2      | 0.00080       |
| .4       | 80            |
| .6       | 79            |
| .8       | 78            |
| 6.0      | 76            |
| 6.2      | 0.00072       |
| .4       | 68            |
| .6       | 64            |
| .8       | 59            |
| 7.0      | 54            |
| 7.2      | 0.00049       |
| .4       | 44            |
| .6       | 39            |
| .8       | 34            |
| 8.0      | 30            |
| 8.2      | 0.00026       |
| .4       | 23            |
| .6       | 21            |
| .8       | 20            |
| 9.0      | 20            |
| 9.2      | 0.00021       |
| .4       | 22            |
| .6       | 25            |
| .8       | 28            |
| 10.0     | 0.00032       |

Applied Constant: +0.00000.

Constant: +0.00050.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XVII

Equation of Longitude

Argument D

| D    | Equatio | $\Delta$<br>o <sup>d</sup> or | D    | Equatio | $\Delta$<br>o <sup>d</sup> or | D    | Equatio | $\Delta$<br>o <sup>d</sup> or | D    | Equatio | $\Delta$<br>o <sup>d</sup> or |
|------|---------|-------------------------------|------|---------|-------------------------------|------|---------|-------------------------------|------|---------|-------------------------------|
| 0 00 | 0 200   | + 153                         | 1 00 | 0 33393 | + 98                          | 2 00 | 0 37080 | - 29                          | 3 00 | 0 28433 | - 133                         |
| 02   | 2 306   | 153                           | 02   | 33587   | 96                            | 02   | 37 0    | 31                            | 02   | 8165    | 135                           |
| 04   | 2061    | 153                           | 04   | 33775   | 93                            | 04   | 36955   | 34                            | 04   | 7894    | 136                           |
| 06   | 0918    | 153                           | 06   | 33959   | 91                            | 06   | 36885   | 36                            | 06   | 76 1    | 137                           |
| 08   | 1       | 15                            | 08   | 34139   | 89                            | 08   | 36810   | 39                            | 08   | 7346    | 138                           |
| 10   | 1528    | 153                           | 10   | 34315   | 87                            | 10   | 367 9   | 42                            | 10   | 27068   | 139                           |
| 0 12 | 1833    | + 15                          | 1 12 | 0 34487 | + 85                          | 2 12 | 0 36644 | - 44                          | 3 12 | 26789   | - 140                         |
| 14   | 2136    | 15                            | 14   | 34653   | 8                             | 14   | 36553   | 47                            | 14   | 6507    | 141                           |
| 16   | 2439    | 151                           | 16   | 34815   | 8                             | 16   | 36458   | 49                            | 16   | 62 4    | 14                            |
| 18   | 741     | 15                            | 18   | 34973   | 78                            | 18   | 36358   | 5                             | 18   | 5938    | 144                           |
| 20   | 3043    | 151                           | 20   | 351 6   | 75                            | 20   | 36 51   | 55                            | 20   | 25650   | 144                           |
| 0 22 | 3344    | + 15                          | 1 22 | 0 35274 | + 73                          | 2 22 | 36140   | - 57                          | 3 22 | 0 25362 | - 145                         |
| 24   | 3644    | 5                             | 24   | 35418   | 71                            | 24   | 360 5   | 59                            | 24   | 25071   | 146                           |
| 26   | 3943    | 149                           | 26   | 35557   | 68                            | 26   | 35904   | 62                            | 26   | 4779    | 146                           |
| 28   | 4 39    | 148                           | 28   | 35690   | 66                            | 28   | 35778   | 64                            | 28   | 24485   | 147                           |
| 30   | 24536   | 148                           | 30   | 358 0   | 63                            | 30   | 35648   | 67                            | 30   | 24190   | 148                           |
| 0 32 | 0 4830  | + 147                         | 1 32 | 0 35943 | + 61                          | 2 32 | 0 35512 | - 69                          | 3 32 | 0 23893 | - 149                         |
| 34   | 251 3   | 146                           | 34   | 36063   | 59                            | 34   | 35373   | 71                            | 34   | 3596    | 149                           |
| 36   | 25414   | 145                           | 36   | 36177   | 56                            | 36   | 352 8   | 73                            | 36   | 23298   | 150                           |
| 38   | 57 4    | 145                           | 38   | 36 86   | 54                            | 38   | 35080   | 76                            | 38   | 2998    | 150                           |
| 40   | 599     | 144                           | 40   | 36391   | 51                            | 40   | 34926   | 78                            | 40   | 2697    | 151                           |
| 0 42 | 6 78    | + 143                         | 1 42 | 0 36489 | + 48                          | 2 42 | 0 34768 | - 80                          | 3 42 | 0 2395  | - 151                         |
| 44   | 656     | 14                            | 44   | 36584   | 46                            | 44   | 34605   | 83                            | 44   | 22093   | 151                           |
| 46   | 6844    | 141                           | 46   | 3667    | 43                            | 46   | 34437   | 85                            | 46   | 21790   | 152                           |
| 48   | 27125   | 140                           | 48   | 36757   | 41                            | 48   | 34 65   | 87                            | 48   | 21487   | 15                            |
| 50   | 74      | 138                           | 50   | 36835   | 38                            | 50   | 34088   | 89                            | 50   | 1184    | 152                           |
| 0 52 | 0 27678 | + 137                         | 1 52 | 0 36909 | + 36                          | 2 52 | 0 33908 | - 92                          | 3 52 | 0 20879 | - 152                         |
| 54   | 7951    | 136                           | 54   | 36977   | 33                            | 54   | 337     | 94                            | 54   | 20575   | 15                            |
| 56   | 8       | 135                           | 56   | 37 40   | 3                             | 56   | 33533   | 96                            | 56   | 0 70    | 153                           |
| 58   | 849     | 133                           | 58   | 37098   | 8                             | 58   | 33339   | 98                            | 58   | 19965   | 152                           |
| 60   | 28756   | 13                            | 60   | 37151   | 25                            | 60   | 33142   | 100                           | 60   | 19661   | 152                           |
| 0 62 | 0 9018  | + 131                         | 1 62 | 0 37197 | + 2                           | 2 62 | 32940   | - 102                         | 3 62 | 0 19356 | - 152                         |
| 64   | 29 78   | 13                            | 64   | 37239   |                               | 64   | 3 735   | 104                           | 64   | 19 5    | 152                           |
| 66   | 9536    | 1 8                           | 66   | 37 76   | 17                            | 66   | 3 5 5   | 106                           | 66   | 18747   | 15                            |
| 68   | 9789    | 1 6                           | 68   | 37307   | 15                            | 68   | 3 31    | 108                           | 68   | 18444   | 15                            |
| 70   | 3 040   | 1 5                           | 70   | 37334   | 1                             | 70   | 32095   | 110                           | 70   | 18141   | 151                           |
| 0 72 | 0 30 88 | + 123                         | 1 72 | 0 37354 | + 9                           | 2 72 | 0 31874 | - 111                         | 3 72 | 0 17838 | - 151                         |
| 74   | 30533   | 1                             | 74   | 3737    | 6                             | 74   | 31650   | 113                           | 74   | 17536   | 151                           |
| 76   | 30775   | 1                             | 76   | 37379   | 3                             | 76   | 314 1   | 115                           | 76   | 17234   | 151                           |
| 78   | 31013   | 118                           | 78   | 37383   | + 1                           | 78   | 3119    | 117                           | 78   | 16934   | 150                           |
| 80   | 31248   | 117                           | 80   | 37383   | - 2                           | 80   | 30955   | 118                           | 80   | 16634   | 150                           |
| 0 82 | 31479   | + 115                         | 1 82 | 0 37377 | - 4                           | 2 82 | 0 30717 | - 1 0                         | 3 82 | 0 16336 | - 149                         |
| 84   | 317 7   | 113                           | 84   | 37365   | 7                             | 84   | 30475   | 1                             | 84   | 16 39   | 148                           |
| 86   | 3193    | 11                            | 86   | 37348   | 10                            | 86   | 3 30    | 123                           | 86   | 15743   | 148                           |
| 88   | 3 151   | 109                           | 88   | 37325   | 13                            | 88   | 2998    | 1 5                           | 88   | 15448   | 147                           |
| 90   | 3 368   | 108                           | 90   | 37 98   | 15                            | 90   | 9731    | 127                           | 90   | 15154   | 146                           |
| 0 92 | 32581   | + 106                         | 1 92 | 0 37265 | - 18                          | 2 92 | 29476   | - 128                         | 3 92 | 0 14863 | - 146                         |
| 94   | 3279    | 104                           | 94   | 372 7   | 21                            | 94   | 9 0     | 129                           | 94   | 14572   | 145                           |
| 96   | 3 995   | 102                           | 96   | 37183   | 23                            | 96   | 28960   | 131                           | 96   | 14284   | 144                           |
| 98   | 33196   | 100                           | 98   | 37134   | 26                            | 98   | 28697   | 132                           | 98   | 13997   | 143                           |
| 1 00 | 0 33393 | + 98                          | 2 00 | 0 37080 | - 9                           | 3 00 | 0 28433 | - 133                         | 4 00 | 0 13711 | - 14                          |

Applied to the + 0000



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XVII *continued*

Equation of Longitude

Argument D

| 1                    | 2                       | 3                  | 1                    | 2                       | 3                  | 1                    | 2                       | 3                  | 1                    | 2                       | 3                  |
|----------------------|-------------------------|--------------------|----------------------|-------------------------|--------------------|----------------------|-------------------------|--------------------|----------------------|-------------------------|--------------------|
| D                    | Equation                | $\Delta_{0^d 0^m}$ | D                    | Equation                | $\Delta_{0^d 0^m}$ | D                    | Equation                | $\Delta_{0^d 0^m}$ | D                    | Equation                | $\Delta_{0^d 0^m}$ |
| <sup>d</sup><br>4.00 | <sup>o</sup><br>0.13711 | - 142              | <sup>d</sup><br>5.00 | <sup>o</sup><br>0.03520 | - 49               | <sup>d</sup><br>6.00 | <sup>o</sup><br>0.05222 | + 81               | <sup>d</sup><br>7.00 | <sup>o</sup><br>0.17628 | + 152              |
| .02                  | .13428                  | 141                | .02                  | .3425                   | 46                 | .02                  | .5386                   | 83                 | .02                  | .17932                  | 152                |
| .04                  | .13147                  | 140                | .04                  | .3335                   | 44                 | .04                  | .5553                   | 85                 | .04                  | .18235                  | 152                |
| .06                  | .12869                  | 139                | .06                  | .3251                   | 41                 | .06                  | .5725                   | 87                 | .06                  | .18540                  | 153                |
| .08                  | .12592                  | 138                | .08                  | .3172                   | 38                 | .08                  | .5902                   | 89                 | .08                  | .18846                  | 153                |
| .10                  | .12318                  | 137                | .10                  | .3099                   | 36                 | .10                  | .6083                   | 91                 | .10                  | .19151                  | 153                |
| 4.12                 | 0.12045                 | - 136              | 5.12                 | 0.03030                 | - 33               | 6.12                 | 0.06267                 | + 93               | 7.12                 | 0.19457                 | + 153              |
| .14                  | .11775                  | 134                | .14                  | .2967                   | 31                 | .14                  | .6456                   | 96                 | .14                  | .19762                  | 153                |
| .16                  | .11509                  | 133                | .16                  | .2908                   | 28                 | .16                  | .6649                   | 98                 | .16                  | .20068                  | 153                |
| .18                  | .11244                  | 132                | .18                  | .2856                   | 25                 | .18                  | .6847                   | 100                | .18                  | .20374                  | 153                |
| .20                  | .10981                  | 131                | .20                  | .2807                   | 23                 | .20                  | .7049                   | 102                | .20                  | .20680                  | 153                |
| 4.22                 | 0.10722                 | - 129              | 5.22                 | 0.02764                 | - 20               | 6.22                 | 0.07255                 | + 104              | 7.22                 | 0.20986                 | + 153              |
| .24                  | .10466                  | 127                | .24                  | .2728                   | 17                 | .24                  | .7465                   | 106                | .24                  | .21290                  | 152                |
| .26                  | .10213                  | 126                | .26                  | .2696                   | 15                 | .26                  | .7679                   | 108                | .26                  | .21596                  | 153                |
| .28                  | .9962                   | 125                | .28                  | .2670                   | 12                 | .28                  | .7897                   | 110                | .28                  | .21900                  | 152                |
| .30                  | .9715                   | 123                | .30                  | .2648                   | 9                  | .30                  | .8118                   | 112                | .30                  | .22204                  | 152                |
| 4.32                 | 0.09470                 | - 121              | 5.32                 | 0.02633                 | - 7                | 6.32                 | 0.08343                 | + 113              | 7.32                 | 0.22507                 | + 151              |
| .34                  | .9230                   | 120                | .34                  | .2622                   | 4                  | .34                  | .8571                   | 115                | .34                  | .22809                  | 151                |
| .36                  | .8992                   | 118                | .36                  | .2617                   | - 1                | .36                  | .8803                   | 117                | .36                  | .23111                  | 151                |
| .38                  | .8758                   | 116                | .38                  | .2618                   | + 2                | .38                  | .9039                   | 119                | .38                  | .23412                  | 150                |
| .40                  | .8527                   | 114                | .40                  | .2623                   | 4                  | .40                  | .9278                   | 121                | .40                  | .23710                  | 149                |
| 4.42                 | 0.08301                 | - 113              | 5.42                 | 0.02634                 | + 7                | 6.42                 | 0.09521                 | + 122              | 7.42                 | 0.24009                 | + 149              |
| .44                  | .8077                   | 111                | .44                  | .2651                   | 10                 | .44                  | .9766                   | 123                | .44                  | .24306                  | 148                |
| .46                  | .7857                   | 109                | .46                  | .2672                   | 12                 | .46                  | .10014                  | 125                | .46                  | .24602                  | 148                |
| .48                  | .7641                   | 107                | .48                  | .2700                   | 15                 | .48                  | .10266                  | 127                | .48                  | .24896                  | 147                |
| .50                  | .7428                   | 105                | .50                  | .2732                   | 18                 | .50                  | .10520                  | 128                | .50                  | .25189                  | 146                |
| 4.52                 | 0.07220                 | - 103              | 5.52                 | 0.02770                 | + 20               | 6.52                 | 0.10779                 | + 130              | 7.52                 | 0.25480                 | + 145              |
| .54                  | .7015                   | 101                | .54                  | .2813                   | 23                 | .54                  | .11039                  | 131                | .54                  | .25770                  | 144                |
| .56                  | .6815                   | 99                 | .56                  | .2861                   | 26                 | .56                  | .11302                  | 133                | .56                  | .26057                  | 143                |
| .58                  | .6618                   | 98                 | .58                  | .2915                   | 28                 | .58                  | .11569                  | 134                | .58                  | .26343                  | 142                |
| .60                  | .6425                   | 96                 | .60                  | .2973                   | 31                 | .60                  | .11838                  | 135                | .60                  | .26627                  | 141                |
| 4.62                 | 0.06236                 | - 93               | 5.62                 | 0.03038                 | + 34               | 6.62                 | 0.12109                 | + 136              | 7.62                 | 0.26908                 | + 140              |
| .64                  | .6052                   | 91                 | .64                  | .3107                   | 36                 | .64                  | .12383                  | 138                | .64                  | .27188                  | 139                |
| .66                  | .5873                   | 89                 | .66                  | .3182                   | 39                 | .66                  | .12659                  | 139                | .66                  | .27465                  | 138                |
| .68                  | .5697                   | 87                 | .68                  | .3262                   | 41                 | .68                  | .12937                  | 140                | .68                  | .27741                  | 137                |
| .70                  | .5526                   | 85                 | .70                  | .3347                   | 44                 | .70                  | .13218                  | 141                | .70                  | .28013                  | 136                |
| 4.72                 | 0.05359                 | - 82               | 5.72                 | 0.03437                 | + 47               | 6.72                 | 0.13500                 | + 142              | 7.72                 | 0.28283                 | + 135              |
| .74                  | .5197                   | 80                 | .74                  | .3533                   | 49                 | .74                  | .13785                  | 143                | .74                  | .28551                  | 133                |
| .76                  | .5040                   | 78                 | .76                  | .3633                   | 52                 | .76                  | .14072                  | 144                | .76                  | .28816                  | 132                |
| .78                  | .4887                   | 76                 | .78                  | .3739                   | 54                 | .78                  | .14360                  | 145                | .78                  | .29078                  | 130                |
| .80                  | .4738                   | 73                 | .80                  | .3849                   | 57                 | .80                  | .14650                  | 146                | .80                  | .29337                  | 129                |
| 4.82                 | 0.04595                 | - 71               | 5.82                 | 0.03965                 | + 59               | 6.82                 | 0.14942                 | + 147              | 7.82                 | 0.29595                 | + 128              |
| .84                  | .4456                   | 69                 | .84                  | .4085                   | 61                 | .84                  | .15236                  | 147                | .84                  | .29847                  | 126                |
| .86                  | .4321                   | 66                 | .86                  | .4210                   | 64                 | .86                  | .15530                  | 148                | .86                  | .30098                  | 125                |
| .88                  | .4192                   | 64                 | .88                  | .4341                   | 66                 | .88                  | .15826                  | 149                | .88                  | .30345                  | 123                |
| .90                  | .4067                   | 61                 | .90                  | .4475                   | 69                 | .90                  | .16124                  | 149                | .90                  | .30589                  | 121                |
| 4.92                 | 0.03948                 | - 58               | 5.92                 | 0.04615                 | + 71               | 6.92                 | 0.16423                 | + 150              | 7.92                 | 0.30830                 | + 120              |
| .94                  | .3834                   | 56                 | .94                  | .4760                   | 74                 | .94                  | .16723                  | 150                | .94                  | .31068                  | 118                |
| .96                  | .3724                   | 54                 | .96                  | .4909                   | 76                 | .96                  | .17024                  | 151                | .96                  | .31302                  | 116                |
| .98                  | .3619                   | 51                 | .98                  | .5063                   | 78                 | .98                  | .17326                  | 151                | .98                  | .31532                  | 114                |
| 5.00                 | 0.03520                 | - 49               | 6.00                 | 0.05222                 | + 81               | 7.00                 | 0.17628                 | + 152              | 8.00                 | 0.31758                 | + 112              |

Applied Constant:  $+0^{\circ}.20000$ .

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XVIII

Equation of Longitude

Argument E

| E    | Equa<br>tion | 3<br>$\Delta$<br>or | 4<br>$\frac{1}{2}\Delta^2$ | E    | Equa<br>tion | 3<br>$\Delta$<br>or | 4<br>$\frac{1}{2}\Delta^2$ | E    | Equa<br>tion | 3<br>$\Delta$<br>or | 4<br>$\frac{1}{2}\Delta^2$ | E    | Equa<br>tion | 3<br>$\Delta$<br>or | 4<br>$\frac{1}{2}\Delta^2$ |
|------|--------------|---------------------|----------------------------|------|--------------|---------------------|----------------------------|------|--------------|---------------------|----------------------------|------|--------------|---------------------|----------------------------|
| 0 00 | 8 0          | +64 8               |                            | 2 00 | 15 50        | -1                  | -0 3                       | 4 00 | 53 7         | -6 4                | + 1                        | 6 00 | 01734        | +34 3               | +0 3                       |
| 04   | 8 59         | 64 6                |                            | 04   | 15198        | 14 1                | 0 3                        | 04   | 5087         | 59 4                | 0 1                        | 04   | 1874         | 36 0                | 0 2                        |
| 08   | 8517         | 64 6                | 0                          | 08   | 15 37        | 16 5                | 4                          | 08   | 485          | 58 4                | 0 1                        | 08   | 02           | 37 6                | 0 3                        |
| 12   | 8777         | 64 5                | -0 1                       | 12   | 15066        | 18 6                | 3                          | 12   | 4619         | 57 5                | 0 1                        | 12   | 178          | 39 9                | 0 1                        |
| 16   | 9 33         | 64 1                | 0 0                        | 16   | 14988        | 0 9                 | 3                          | 16   | 4392         | 56 5                | 1                          | 16   | 341          | 41 5                | 0                          |
| 20   | 9 90         | 64 0                | 0 0                        | 20   | 14899        | 23 1                | 0 3                        | 20   | 4167         | 55 5                | 1                          | 20   | 511          | 43 5                | 0 1                        |
| 0 24 | 09545        | +63 4               | - 1                        | 2 24 | 0 14803      | -25 1               | -0 3                       | 4 24 | 0 03948      | -54 1               | + 2                        | 6 24 | 0 0 689      | +45 0               | + 2                        |
| 28   | 9797         | 63 0                | 1                          | 28   | 14698        | 7 1                 | 3                          | 28   | 3734         | 5 8                 | 0 1                        | 28   | 871          | 46 5                | 0 2                        |
| 32   | 1 049        | 62 4                | 1                          | 32   | 14586        | 9 1                 | 0 3                        | 32   | 35 6         | 51 5                | 0 1                        | 32   | 3061         | 48 1                | 0 2                        |
| 36   | 96           | 61 5                | 1                          | 36   | 14465        | 31 1                | 3                          | 36   | 3322         | 5                   | 0                          | 36   | 3 56         | 49 5                | 0                          |
| 40   | 10541        | 60 8                | 1                          | 40   | 14337        | 33 1                | 3                          | 40   | 31 6         | 48 5                | 2                          | 40   | 3457         | 51 1                | 0 2                        |
| 0 44 | 1 78         | +59 9               | -0 1                       | 2 44 | 14 0         | -35 1               | - 3                        | 4 44 | 0 02934      | -47 1               | +0 3                       | 6 44 | 0 03665      | +52 5               | +0 1                       |
| 48   | 110          | 59                  | 0 1                        | 48   | 14056        | 37 0                | 0 3                        | 48   | 2749         | 45 5                | 0                          | 48   | 3877         | 53 8                | 0 1                        |
| 52   | 11 54        | 58 3                | 0 1                        | 52   | 139 4        | 38 9                | 0                          | 52   | 570          | 43 9                | 0                          | 52   | 4095         | 55 0                | 0 1                        |
| 56   | 1 486        | 57 4                | 0 1                        | 56   | 13745        | 4 5                 | 0                          | 56   | 398          | 4                   | 0                          | 56   | 4317         | 56 1                | 0 2                        |
| 60   | 11713        | 56 0                | 0 1                        | 60   | 13580        | 4 3                 | 0 1                        | 60   | 34           | 40 4                | 0                          | 60   | 4544         | 57 4                | 0 1                        |
| 0 64 | 0 11934      | +54 9               | -0 1                       | 2 64 | 0 13407      | -44 0               | -0 2                       | 4 64 | 0 02075      | -38 6               | +0 2                       | 6 64 | 0 04776      | +58 4               | +0 1                       |
| 68   | 1 15         | 53 6                | 0 2                        | 68   | 13 28        | 45 6                | 0 2                        | 68   | 1925         | 36 5                | 0 2                        | 68   | 5011         | 59 4                | +0 1                       |
| 72   | 12363        | 5 3                 | 0 1                        | 72   | 1304         | 47 4                | 0 1                        | 72   | 1783         | 34 9                | 0 2                        | 72   | 5251         | 60 1                | 0 0                        |
| 76   | 12570        | 5 9                 | 0 1                        | 76   | 12849        | 48 9                | 0 1                        | 76   | 1646         | 33 0                | 0                          | 76   | 5492         | 60 8                | +0 1                       |
| 80   | 1 770        | 49 3                | 1                          | 80   | 1 651        | 50 3                | 0 1                        | 80   | 1519         | 31 0                | 0 3                        | 80   | 5737         | 61 6                | 0 0                        |
| 0 84 | 1 964        | +47 9               | - 1                        | 2 84 | 0 1 447      | -51 6               | -0                         | 4 84 | 0 1398       | -29 1               | +0 2                       | 6 84 | 0 05985      | +62 5               | +0 1                       |
| 88   | 13153        | 46 5                | 0 1                        | 88   | 12 38        | 53 0                | 1                          | 88   | 1286         | 6 9                 | 0 4                        | 88   | 6237         | 63 1                | 0 1                        |
| 92   | 13335        | 44 8                | 0                          | 92   | 120 3        | 54 3                | 1                          | 92   | 1183         | 24 6                | 0 3                        | 92   | 649          | 63 4                | 0 1                        |
| 96   | 13511        | 43 1                | 0                          | 96   | 11804        | 55 5                | 0 1                        | 96   | 1089         | 5                   | 0 3                        | 96   | 6745         | 63 6                | +0 1                       |
| 1 00 | 13680        | 41 4                | 0                          | 3 00 | 11579        | 56 5                | 0 2                        | 5 00 | 1 03         | 20 5                | 3                          | 7 00 | 6999         | 63 8                | 0 0                        |
| 1 04 | 13842        | +39 6               | -0                         | 3 04 | 0 11352      | -57 6               | - 1                        | 5 04 | 0 00925      | -18 4               | +0 4                       | 7 04 | 0 07255      | +64 5               | +0 1                       |
| 08   | 13997        | 37 8                | 0 3                        | 08   | 11118        | 58 9                | -0 1                       | 08   | 856          | 16 3                | 3                          | 08   | 7515         | 64 7                | 0 0                        |
| 12   | 14144        | 35 9                | 0                          | 12   | 10881        | 59 6                | 0 0                        | 12   | 795          | 14                  | 0 3                        | 12   | 7773         | 64 6                | 0 0                        |
| 16   | 14 84        | 34 0                | 0 3                        | 16   | 10641        | 6 3                 | -0 1                       | 16   | 744          | 11 6                | 3                          | 16   | 803          | 65 0                | 0                          |
| 20   | 14416        | 31 9                | 0 3                        | 20   | 10399        | 61 1                | 0 1                        | 20   | 70           | 9 4                 | 0 3                        | 20   | 8293         | 64 9                | 0 0                        |
| 1 24 | 0 14539      | +29 9               | -0 3                       | 3 24 | 0 1015       | -62 0               | -0 1                       | 5 24 | 0 00669      | - 7 3               | +0 3                       | 7 24 | 0 08551      | +64 8               | 0 0                        |
| 28   | 14655        | 28 1                | 0 3                        | 28   | 9903         | 62 5                | 0 0                        | 28   | 644          | 5 0                 | 0 3                        | 28   | 8811         | 64 5                | 0 0                        |
| 32   | 14764        | 6 1                 | 3                          | 32   | 965          | 63 1                | 0 0                        | 32   | 6 9          | 2 6                 | 0 3                        | 32   | 9 67         | 64 0                | 0 0                        |
| 36   | 14864        | 23 6                | 0 4                        | 36   | 9398         | 63 5                | 0                          | 36   | 6 3          | -0 4                | 0 3                        | 36   | 93 3         | 63 9                | 0 0                        |
| 40   | 14953        | 21 4                | 3                          | 40   | 9144         | 64 0                | 0                          | 40   | 626          | + 1 9               | 0 3                        | 40   | 9578         | 63 4                | -0 1                       |
| 1 44 | 15 35        | +19 5               | -0 3                       | 3 44 | 0 08886      | -64 5               | 0 0                        | 5 44 | 0 00638      | + 4 1               | +0 4                       | 7 44 | 0 09830      | +62 9               | -0 1                       |
| 48   | 151 9        | 17 4                | 3                          | 48   | 8628         | 64 4                | 0 0                        | 48   | 659          | 6 6                 | 0 3                        | 48   | 10 81        | 6 3                 | 0 0                        |
| 52   | 15174        | 15 1                | 3                          | 52   | 8371         | 64 5                | 0                          | 52   | 691          | 9                   | 4                          | 52   | 103 8        | 61 5                | -0 1                       |
| 56   | 15 3         | 1 9                 | 0 3                        | 56   | 811          | 64 6                | 0                          | 56   | 731          | 11 0                | 0 3                        | 56   | 1 573        | 60 6                | 0 1                        |
| 60   | 15 77        | 1 6                 | 0 3                        | 60   | 7854         | 64 6                | 0 0                        | 60   | 779          | 13 1                | 0 3                        | 60   | 10813        | 59 8                | 0 1                        |
| 1 64 | 0 15315      | + 7 6               | - 3                        | 3 64 | 07595        | -64 6               | 0 0                        | 5 64 | 0 00836      | +15 1               | +0 3                       | 7 64 | 0 11051      | +59                 | -0 1                       |
| 68   | 15341        | 6                   | 0 3                        | 68   | 7337         | 64 4                | 0 0                        | 68   | 900          | 17 3                | 0 3                        | 68   | 11 85        | 58 0                | 0 1                        |
| 72   | 15363        | 4 5                 | 0 3                        | 72   | 7 80         | 64 3                | 0                          | 72   | 974          | 19 8                | 0 4                        | 72   | 11515        | 57 0                | 1                          |
| 76   | 15374        | + 1 8               | 3                          | 76   | 68 3         | 63 9                | + 1                        | 76   | 1058         | 2 0                 | 0 3                        | 76   | 11741        | 56 0                | 0 1                        |
| 80   | 15377        | -0 4                | 3                          | 80   | 6569         | 63 5                | 0                          | 80   | 1150         | 4 0                 | 3                          | 80   | 11963        | 54 8                | 0 1                        |
| 1 84 | 15371        | - 2 8               | - 4                        | 3 84 | 0 06315      | -63 0               | 0                          | 5 84 | 0 01 50      | + 6 1               | + 3                        | 7 84 | 0 12179      | +53 5               | -0 1                       |
| 88   | 15355        | 5 4                 | 4                          | 88   | 6065         | 62 4                | + 1                        | 88   | 1359         | 8 1                 | 0                          | 88   | 12391        | 5 3                 | 0                          |
| 92   | 153 8        | 7 6                 | 3                          | 92   | 5816         | 61 8                | 0 1                        | 92   | 1476         | 30 1                | 0 3                        | 92   | 12597        | 50 6                | 0 2                        |
| 96   | 15294        | 9 8                 | 0 3                        | 96   | 5570         | 61 1                | 0 1                        | 96   | 1600         | 32 3                | 2                          | 96   | 1 796        | 49 0                | 0 1                        |
| 2 00 | 15 5         | -12                 | -0 3                       | 4 00 | 0 53 7       | -60 4               | +0 1                       | 6 00 | 0 01734      | +34 3               | + 3                        | 8 00 | 0 12989      | +47 5               | -0                         |

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

**XIX**

| 1   | 2        | 1   | 2        |
|-----|----------|-----|----------|
| F   | Equation | F   | Equation |
| d   | °        | d   | °        |
| 0.0 | 0.00100  | 4.0 | 0.00136  |
| .2  | 86       | .2  | 148      |
| .4  | 72       | .4  | 158      |
| .6  | 60       | .6  | 166      |
| .8  | 48       | .8  | 173      |
| 1.0 | 39       | 5.0 | 177      |
| 1.2 | 0.00031  | 5.2 | 0.00178  |
| .4  | 26       | .4  | 177      |
| .6  | 23       | .6  | 173      |
| .8  | 22       | .8  | 167      |
| 2.0 | 24       | 6.0 | 159      |
| 2.2 | 0.00029  | 6.2 | 0.00149  |
| .4  | 36       | .4  | 137      |
| .6  | 45       | .6  | 124      |
| .8  | 56       | .8  | 110      |
| 3.0 | 68       | 7.0 | 96       |
| 3.2 | 0.00081  | 7.2 | 0.00082  |
| .4  | 95       | .4  | 69       |
| .6  | 109      | .6  | 57       |
| .8  | 123      | .8  | 46       |
| 4.0 | 0.00136  | 8.0 | 0.00037  |

Applied Constant: +0.00000.

**XX**

| 1   | 2        | 1   | 2        |
|-----|----------|-----|----------|
| G   | Equation | G   | Equation |
| d   | °        | d   | °        |
| 0.0 | 0.00050  | 4.0 | 0.00066  |
| .2  | 44       | .2  | 71       |
| .4  | 38       | .4  | 76       |
| .6  | 32       | .6  | 80       |
| .8  | 27       | .8  | 83       |
| 1.0 | 22       | 5.0 | 84       |
| 1.2 | 0.00019  | 5.2 | 0.00085  |
| .4  | 17       | .4  | 85       |
| .6  | 15       | .6  | 83       |
| .8  | 15       | .8  | 80       |
| 2.0 | 16       | 6.0 | 76       |
| 2.2 | 0.00018  | 6.2 | 0.00072  |
| .4  | 21       | .4  | 67       |
| .6  | 25       | .6  | 61       |
| .8  | 30       | .8  | 55       |
| 3.0 | 35       | 7.0 | 48       |
| 3.2 | 0.00041  | 7.2 | 0.00042  |
| .4  | 48       | .4  | 36       |
| .6  | 54       | .6  | 31       |
| .8  | 60       | .8  | 26       |
| 4.0 | 0.00066  | 8.0 | 0.00022  |

Applied Constant: +0.00050.

**XXI**

| 1   | 2        | 1   | 2        |
|-----|----------|-----|----------|
| H   | Equation | H   | Equation |
| d   | °        | d   | °        |
| 0.0 | 0.00100  | 4.0 | 0.00081  |
| .2  | 109      | .2  | 72       |
| .4  | 118      | .4  | 65       |
| .6  | 127      | .6  | 58       |
| .8  | 135      | .8  | 53       |
| 1.0 | 141      | 5.0 | 49       |
| 1.2 | 0.00147  | 5.2 | 0.00047  |
| .4  | 151      | .4  | 46       |
| .6  | 153      | .6  | 47       |
| .8  | 154      | .8  | 50       |
| 2.0 | 153      | 6.0 | 54       |
| 2.2 | 0.00151  | 6.2 | 0.00059  |
| .4  | 147      | .4  | 66       |
| .6  | 141      | .6  | 74       |
| .8  | 134      | .8  | 83       |
| 3.0 | 127      | 7.0 | 92       |
| 3.2 | 0.00118  | 7.2 | 0.00101  |
| .4  | 109      | .6  | 110      |
| .6  | 99       | .4  | 120      |
| .8  | 90       | .8  | 128      |
| 4.0 | 0.00081  | 8.0 | 0.00136  |

Applied Constant: +0.00000.

**XXII**

Argument I

| 1    | 2        | 3               | 1    | 2        | 3               | 1    | 2        | 3               | 1    | 2        | 3               | 1    | 2        | 3               |
|------|----------|-----------------|------|----------|-----------------|------|----------|-----------------|------|----------|-----------------|------|----------|-----------------|
| I    | Equation | $\Delta_{0d.1}$ | I    | Equation | $\Delta_{0d.1}$ | I    | Equation | $\Delta_{0d.1}$ | I    | Equation | $\Delta_{0d.1}$ | I    | Equation | $\Delta_{0d.1}$ |
| d    | °        |                 | d    | °        |                 | d    | °        |                 | d    | °        |                 | d    | °        |                 |
| 0.0  | 0.00700  | - 7,6           | 11.0 | 0.00107  | - 1,4           | 22.0 | 0.00473  | + 7,0           | 33.0 | 0.01206  | + 4,1           | 44.0 | 0.01121  | - 5,4           |
| 0.5  | 662      | 7,5             | 11.5 | 101      | 1,0             | 22.5 | 508      | 7,2             | 33.5 | 1225     | 3,7             | 44.5 | 1093     | 5,7             |
| 1.0  | 625      | 7,5             | 12.0 | 97       | - 0,5           | 23.0 | 545      | 7,4             | 34.0 | 1243     | 3,4             | 45.0 | 1064     | 6,0             |
| 1.5  | 587      | 7,5             | 12.5 | 96       | 0,0             | 23.5 | 582      | 7,5             | 34.5 | 1259     | 2,9             | 45.5 | 1033     | 6,4             |
| 2.0  | 550      | 7,3             | 13.0 | 97       | + 0,4           | 24.0 | 620      | 7,5             | 35.0 | 1272     | 2,4             | 46.0 | 1000     | 6,6             |
| 2.5  | 514      | 7,1             | 13.5 | 100      | 0,9             | 24.5 | 657      | 7,4             | 35.5 | 1283     | 2,0             | 46.5 | 967      | 6,8             |
| 3.0  | 0.00479  | - 7,0           | 14.0 | 0.00106  | + 1,4           | 25.0 | 0.00694  | + 7,5           | 36.0 | 0.01292  | + 1,5           | 47.0 | 0.00932  | - 7,0           |
| 3.5  | 444      | 6,9             | 14.5 | 114      | 1,8             | 25.5 | 732      | 7,6             | 36.5 | 1298     | 1,0             | 47.5 | 897      | 7,1             |
| 4.0  | 410      | 6,7             | 15.0 | 124      | 2,3             | 26.0 | 770      | 7,5             | 37.0 | 1302     | 0,6             | 48.0 | 861      | 7,3             |
| 4.5  | 377      | 6,4             | 15.5 | 137      | 2,8             | 26.5 | 807      | 7,4             | 37.5 | 1304     | + 0,1           | 48.5 | 824      | 7,4             |
| 5.0  | 346      | 6,1             | 16.0 | 152      | 3,2             | 27.0 | 844      | 7,3             | 38.0 | 1303     | - 0,4           | 49.0 | 787      | 7,4             |
| 5.5  | 0.00316  | - 5,8           | 16.5 | 0.00169  | + 3,6           | 27.5 | 0.00880  | + 7,2           | 38.5 | 0.01300  | - 0,8           | 49.5 | 0.00750  | - 7,5           |
| 6.0  | 288      | 5,5             | 17.0 | 188      | 4,0             | 28.0 | 916      | 7,1             | 39.0 | 1295     | 1,3             | 50.0 | 712      | 7,6             |
| 6.5  | 261      | 5,2             | 17.5 | 209      | 4,4             | 28.5 | 951      | 6,9             | 39.5 | 1287     | 1,8             | 50.5 | 674      | 7,6             |
| 7.0  | 236      | 4,8             | 18.0 | 232      | 4,8             | 29.0 | 985      | 6,7             | 40.0 | 1277     | 2,3             | 51.0 | 636      | 7,5             |
| 7.5  | 213      | 4,4             | 18.5 | 257      | 5,1             | 29.5 | 1018     | 6,4             | 40.5 | 1264     | 2,7             | 51.5 | 599      | 7,4             |
| 8.0  | 0.00192  | - 4,2           | 19.0 | 0.00283  | + 5,4           | 30.0 | 0.01049  | + 6,1           | 41.0 | 0.01250  | - 3,0           | 52.0 | 0.00562  | - 7,3           |
| 8.5  | 171      | 3,8             | 19.5 | 311      | 5,8             | 30.5 | 1079     | 5,9             | 41.5 | 1234     | 3,5             | 52.5 | 526      | 7,2             |
| 9.0  | 154      | 3,2             | 20.0 | 341      | 6,2             | 31.0 | 1108     | 5,6             | 42.0 | 1215     | 4,0             | 53.0 | 490      | 7,1             |
| 9.5  | 139      | 2,8             | 20.5 | 373      | 6,4             | 31.5 | 1135     | 5,2             | 42.5 | 1194     | 4,4             | 53.5 | 455      | 7,0             |
| 10.0 | 126      | 2,4             | 21.0 | 405      | 6,5             | 32.0 | 1160     | 4,9             | 43.0 | 1171     | 4,7             | 54.0 | 420      | 6,8             |
| 10.5 | 0.00115  | - 1,9           | 21.5 | 0.00438  | + 6,8           | 32.5 | 0.01184  | + 4,6           | 43.5 | 0.01147  | - 5,0           | 54.5 | 0.00387  | - 6,5           |
| 11.0 | 0.00107  | - 1,4           | 22.0 | 0.00473  | + 7,0           | 33.0 | 0.01206  | + 4,1           | 44.0 | 0.01121  | - 5,4           | 55.0 | 0.00355  | - 6,3           |

Applied Constant: +0.00700.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

XXIII

| J   | Equatio | J   | Equat on |
|-----|---------|-----|----------|
| 0   | 0 00050 | 250 | 0 00075  |
| 5   | 47      | 255 | 77       |
| 10  | 44      | 260 | 79       |
| 15  | 41      | 265 | 81       |
| 20  | 39      | 270 | 82       |
| 25  | 36      | 275 | 83       |
| 30  | 0 00034 | 280 | 0 00084  |
| 35  | 31      | 285 | 85       |
| 40  | 9       | 290 | 86       |
| 45  | 7       | 295 | 86       |
| 50  | 5       | 300 | 86       |
| 55  | 0 00 23 | 305 | 0 00086  |
| 60  | 1       | 310 | 86       |
| 65  | 19      | 315 | 85       |
| 70  | 18      | 320 | 84       |
| 75  | 17      | 325 | 83       |
| 80  | 0 00016 | 330 | 0 00082  |
| 85  | 15      | 335 | 81       |
| 90  | 14      | 340 | 79       |
| 95  | 14      | 345 | 78       |
| 100 | 14      | 350 | 76       |
| 105 | 0 00014 | 355 | 0 00074  |
| 110 | 14      | 360 | 7        |
| 115 | 15      | 365 | 7        |
| 120 | 16      | 370 | 67       |
| 125 | 17      | 375 | 65       |
| 130 | 0 00018 | 380 | 0 0006   |
| 135 | 19      | 385 | 59       |
| 140 | 1       | 390 | 56       |
| 145 | 3       | 395 | 54       |
| 150 | 4       | 400 | 51       |
| 155 | 0 00026 | 405 | 0 00048  |
| 160 | 9       | 410 | 45       |
| 165 | 31      | 415 | 43       |
| 170 | 33      | 420 | 40       |
| 175 | 36      | 425 | 37       |
| 180 | 0 00039 | 430 | 0 00034  |
| 185 | 4       | 435 | 3        |
| 190 | 44      | 440 | 29       |
| 195 | 47      | 445 | 7        |
| 200 | 5       | 450 | 5        |
| 205 | 0 00053 | 455 | 0 000 3  |
| 210 | 55      | 460 | 21       |
| 215 | 58      | 465 | 19       |
| 220 | 61      | 470 | 18       |
| 225 | 64      | 475 | 17       |
| 230 | 0 00066 | 480 | 0 00016  |
| 235 | 69      | 485 | 15       |
| 240 | 71      | 490 | 15       |
| 245 | 73      | 495 | 14       |
| 250 | 0 00075 | 500 | 0 00014  |

Appli d C t t + s

XXIV

| K   | Equation | $\Delta$<br>r | K   | Equation | $\Delta$<br>rd |
|-----|----------|---------------|-----|----------|----------------|
| 0   | 0 00400  | - 4 6         | 250 | 0 00495  | + 4 4          |
| 5   | 377      | 4 6           | 255 | 516      | 4 3            |
| 10  | 354      | 4 5           | 260 | 538      | 4 1            |
| 15  | 33       | 4 4           | 265 | 558      | 4 0            |
| 20  | 310      | 4 4           | 270 | 578      | 3 8            |
| 25  | 88       | 4 3           | 275 | 596      | 3 6            |
| 30  | 0 00 67  | - 4 2         | 280 | 0 0 614  | + 3 5          |
| 35  | 47       | 4 0           | 285 | 631      | 3 3            |
| 40  | 2 7      | 3 9           | 290 | 647      | 3 1            |
| 45  | 208      | 3 7           | 295 | 66       | 2 8            |
| 50  | 190      | 3 4           | 300 | 675      | 2 6            |
| 55  | 0 00173  | - 3 3         | 305 | 0 00687  | + 2 3          |
| 60  | 157      | 3 1           | 310 | 698      | 2              |
| 65  | 14       | 9             | 315 | 7 7      | 1 7            |
| 70  | 1 8      | 6             | 320 | 715      | 1 4            |
| 75  | 116      | 3             | 325 | 721      | 1 1            |
| 80  | 0 00105  | - 2 1         | 330 | 0 00726  | + 0 8          |
| 85  | 95       | 1 8           | 335 | 7 9      | 0 5            |
| 90  | 87       | 1 5           | 340 | 731      | + 0 2          |
| 95  | 8        | 1 2           | 345 | 731      | 0 0            |
| 100 | 75       | 0 9           | 350 | 731      | - 0 4          |
| 105 | 0 00071  | - 0 6         | 355 | 0 00728  | - 0 8          |
| 110 | 69       | - 0 3         | 360 | 723      | 1 1            |
| 115 | 68       | 0             | 365 | 717      | 1 3            |
| 120 | 69       | + 3           | 370 | 710      | 1 6            |
| 125 | 71       | 0 6           | 375 | 701      | 1 9            |
| 130 | 0 00075  | + 1 0         | 380 | 0 00691  | - 2            |
| 135 | 81       | 1 3           | 385 | 679      | 5              |
| 140 | 88       | 1 6           | 390 | 666      | 2 8            |
| 145 | 97       | 1 9           | 395 | 651      | 3 0            |
| 150 | 107      | 2 2           | 400 | 636      | 3 2            |
| 155 | 0 00119  | + 2 4         | 405 | 0 00619  | - 3 4          |
| 160 | 131      | 2 7           | 410 | 6        | 3 6            |
| 165 | 145      | 2 9           | 415 | 583      | 3 8            |
| 170 | 160      | 3 1           | 420 | 564      | 4 0            |
| 175 | 176      | 3 3           | 425 | 544      | 4 1            |
| 180 | 0 00193  | + 3 6         | 430 | 0 00523  | - 4            |
| 185 | 211      | 3 8           | 435 | 50       | 4 3            |
| 190 | 31       | 4             | 440 | 480      | 4 4            |
| 195 | 251      | 4 1           | 445 | 458      | 4 5            |
| 200 | 7        | 4 2           | 450 | 435      | 4 5            |
| 205 | 0 00 93  | + 4 3         | 455 | 0 0041   | - 4 6          |
| 210 | 315      | 4 4           | 460 | 389      | 4 5            |
| 215 | 337      | 4 5           | 465 | 366      | 4 5            |
| 220 | 360      | 4 5           | 470 | 344      | 4 4            |
| 225 | 38       | 4 5           | 475 | 3        | 4 4            |
| 230 | 0 0405   | + 4 5         | 480 | 0 00300  | - 4 3          |
| 235 | 428      | 4 6           | 485 | 278      | 4 3            |
| 240 | 451      | 4 5           | 490 | 57       | 4 1            |
| 245 | 473      | 4 4           | 495 | 237      | 4 0            |
| 250 | 0 00495  | + 4 4         | 500 | 0 00217  | - 3 8          |

Appli d C t t + 004

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXV

Equations of Longitude

XXVI

| 1   | 2        | 3             | 1   | 2        | 3             |
|-----|----------|---------------|-----|----------|---------------|
| L   | Equation | $\Delta_{rd}$ | L   | Equation | $\Delta_{rd}$ |
| d   | o        |               | d   | o        |               |
| 0   | 0°00700  | + 8,8         | 250 | 0°00622  | - 8,6         |
| 5   | 744      | 8,7           | 255 | 579      | 8,6           |
| 10  | 787      | 8,7           | 260 | 536      | 8,5           |
| 15  | 830      | 8,6           | 265 | 494      | 8,3           |
| 20  | 873      | 8,5           | 270 | 453      | 8,1           |
| 25  | 915      | 8,4           | 275 | 413      | 7,9           |
| 30  | 0°00957  | + 8,1         | 280 | 0°00374  | - 7,7         |
| 35  | 997      | 7,8           | 285 | 336      | 7,4           |
| 40  | 1035     | 7,6           | 290 | 300      | 7,1           |
| 45  | 1072     | 7,3           | 295 | 265      | 6,7           |
| 50  | 1108     | 7,0           | 300 | 233      | 6,3           |
| 55  | 0°01142  | + 6,6         | 305 | 0°00202  | - 5,9         |
| 60  | 1174     | 6,2           | 310 | 174      | 5,5           |
| 65  | 1204     | 5,8           | 315 | 148      | 5,0           |
| 70  | 1232     | 5,4           | 320 | 124      | 4,5           |
| 75  | 1258     | 4,9           | 325 | 102      | 4,0           |
| 80  | 0°01281  | + 4,4         | 330 | 0°00084  | - 3,5         |
| 85  | 1302     | 3,9           | 335 | 68       | 3,0           |
| 90  | 1320     | 3,4           | 340 | 54       | 2,5           |
| 95  | 1336     | 2,9           | 345 | 43       | 1,9           |
| 100 | 1349     | 2,4           | 350 | 35       | 1,4           |
| 105 | 0°01359  | + 1,8         | 355 | 0°00030  | - 0,8         |
| 110 | 1367     | 1,2           | 360 | 27       | - 0,2         |
| 115 | 1372     | 0,6           | 365 | 28       | + 0,4         |
| 120 | 1373     | + 0,1         | 370 | 31       | 1,0           |
| 125 | 1372     | - 0,5         | 375 | 37       | 1,5           |
| 130 | 0°01368  | - 1,1         | 380 | 0°00046  | + 2,1         |
| 135 | 1361     | 1,6           | 385 | 57       | 2,6           |
| 140 | 1352     | 2,2           | 390 | 72       | 3,2           |
| 145 | 1339     | 2,8           | 395 | 89       | 3,7           |
| 150 | 1324     | 3,3           | 400 | 109      | 4,2           |
| 155 | 0°01306  | - 3,8         | 405 | 0°00131  | + 4,7         |
| 160 | 1286     | 4,3           | 410 | 156      | 5,2           |
| 165 | 1263     | 4,8           | 415 | 182      | 5,6           |
| 170 | 1238     | 5,2           | 420 | 212      | 6,0           |
| 175 | 1211     | 5,6           | 425 | 243      | 6,4           |
| 180 | 0°01182  | - 6,1         | 430 | 0°00276  | + 6,8         |
| 185 | 1150     | 6,6           | 435 | 311      | 7,1           |
| 190 | 1116     | 6,9           | 440 | 347      | 7,5           |
| 195 | 1081     | 7,2           | 445 | 385      | 7,8           |
| 200 | 1044     | 7,5           | 450 | 425      | 8,0           |
| 205 | 0°01006  | - 7,8         | 455 | 0°00466  | + 8,2         |
| 210 | 966      | 8,1           | 460 | 507      | 8,4           |
| 215 | 925      | 8,3           | 465 | 550      | 8,6           |
| 220 | 883      | 8,5           | 470 | 593      | 8,6           |
| 225 | 840      | 8,6           | 475 | 637      | 8,7           |
| 230 | 0°00797  | - 8,6         | 480 | 0°00680  | + 8,7         |
| 235 | 754      | 8,7           | 485 | 724      | 8,8           |
| 240 | 710      | 8,7           | 490 | 768      | 8,7           |
| 245 | 666      | 8,6           | 495 | 811      | 8,6           |
| 250 | 0°00622  | - 8,6         | 500 | 0°00854  | + 8,5         |

Applied Constant: +0°00700.

| 1   | 2        | 3             | 1   | 2        | 3             |
|-----|----------|---------------|-----|----------|---------------|
| M   | Equation | $\Delta_{rd}$ | M   | Equation | $\Delta_{rd}$ |
| d   | o        |               | d   | o        |               |
| 0   | 0°00300  | + 3,8         | 250 | 0°00273  | - 3,8         |
| 5   | 319      | 3,8           | 255 | 254      | 3,8           |
| 10  | 338      | 3,8           | 260 | 235      | 3,7           |
| 15  | 357      | 3,7           | 265 | 217      | 3,6           |
| 20  | 375      | 3,7           | 270 | 199      | 3,6           |
| 25  | 393      | 3,6           | 275 | 181      | 3,5           |
| 30  | 0°00411  | + 3,5         | 280 | 0°00164  | - 3,4         |
| 35  | 428      | 3,4           | 285 | 147      | 3,2           |
| 40  | 445      | 3,3           | 290 | 132      | 3,1           |
| 45  | 461      | 3,2           | 295 | 117      | 3,0           |
| 50  | 477      | 3,0           | 300 | 102      | 2,8           |
| 55  | 0°00491  | + 2,8         | 305 | 0°00088  | - 2,6         |
| 60  | 505      | 2,7           | 310 | 76       | 2,4           |
| 65  | 518      | 2,5           | 315 | 64       | 2,2           |
| 70  | 530      | 2,3           | 320 | 54       | 2,1           |
| 75  | 541      | 2,1           | 325 | 44       | 1,9           |
| 80  | 0°00552  | + 1,9         | 330 | 0°00035  | - 1,7         |
| 85  | 561      | 1,7           | 335 | 27       | 1,4           |
| 90  | 569      | 1,5           | 340 | 21       | 1,2           |
| 95  | 576      | 1,3           | 345 | 16       | 0,9           |
| 100 | 582      | 1,1           | 350 | 12       | 0,7           |
| 105 | 0°00587  | + 0,8         | 355 | 0°00009  | - 0,5         |
| 110 | 590      | 0,6           | 360 | 7        | - 0,2         |
| 115 | 592      | + 0,3         | 365 | 7        | + 0,1         |
| 120 | 593      | 0,0           | 370 | 8        | 0,3           |
| 125 | 592      | - 0,2         | 375 | 10       | 0,5           |
| 130 | 0°00591  | - 0,5         | 380 | 0°00013  | + 0,8         |
| 135 | 588      | 0,7           | 385 | 18       | 1,0           |
| 140 | 584      | 0,9           | 390 | 23       | 1,3           |
| 145 | 579      | 1,1           | 395 | 30       | 1,5           |
| 150 | 573      | 1,3           | 400 | 38       | 1,8           |
| 155 | 0°00566  | - 1,5         | 405 | 0°00048  | + 2,1         |
| 160 | 558      | 1,8           | 410 | 57       | 2,2           |
| 165 | 548      | 2,0           | 415 | 68       | 2,3           |
| 170 | 538      | 2,2           | 420 | 80       | 2,5           |
| 175 | 526      | 2,4           | 425 | 93       | 2,7           |
| 180 | 0°00513  | - 2,6         | 430 | 0°00107  | + 2,9         |
| 185 | 499      | 2,8           | 435 | 122      | 3,0           |
| 190 | 485      | 3,0           | 440 | 137      | 3,2           |
| 195 | 470      | 3,1           | 445 | 153      | 3,3           |
| 200 | 454      | 3,2           | 450 | 170      | 3,4           |
| 205 | 0°00438  | - 3,3         | 455 | 0°00187  | + 3,5         |
| 210 | 421      | 3,5           | 460 | 205      | 3,6           |
| 215 | 403      | 3,6           | 465 | 223      | 3,6           |
| 220 | 385      | 3,6           | 470 | 241      | 3,7           |
| 225 | 367      | 3,7           | 475 | 260      | 3,8           |
| 230 | 0°00348  | - 3,7         | 480 | 0°00279  | + 3,8         |
| 235 | 330      | 3,7           | 485 | 298      | 3,8           |
| 240 | 311      | 3,8           | 490 | 317      | 3,8           |
| 245 | 292      | 3,8           | 495 | 336      | 3,7           |
| 250 | 0°00273  | - 3,8         | 500 | 0°00354  | + 3,6         |

Applied Constant: +0°00300.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXVII

Equation of Longitude

Argument  $\alpha$

| $\alpha$ | Equation | $\Delta_{10}$ | $\alpha$ | Equation | $\Delta_{10}$ | $\alpha$ | Equation | $\Delta_{10}$ | $\alpha$ | Equation | $\Delta_{10}$ | $\alpha$ | Equation | $\Delta_{10}$ |
|----------|----------|---------------|----------|----------|---------------|----------|----------|---------------|----------|----------|---------------|----------|----------|---------------|
| 0        | 001400   | -21           | 1000     | 000054   | -             | 2000     | 001098   | +18           | 3000     | 0631     | +8            | 4000     | 002058   | -18           |
| 20       | 1358     | 1             | 1020     | 5        | -1            | 2020     | 1134     | 18            | 3020     | 647      | 8             | 4020     | 022      | 18            |
| 40       | 1317     | 1             | 1040     | 52       |               | 2040     | 1170     | 18            | 3040     | 2661     | 7             | 4040     | 1985     | 19            |
| 60       | 176      | 21            | 1060     | 5        | +1            | 2060     | 107      | 18            | 3060     | 674      | 6             | 4060     | 1947     | 19            |
| 80       | 135      | 1             | 1080     | 54       | 1             | 2080     | 14       | 18            | 3080     | 686      | 6             | 4080     | 199      | 19            |
| 100      | 1194     | 1             | 1100     | 57       |               | 2100     | 1279     | 19            | 3100     | 697      | 5             | 4100     | 1871     | 19            |
| 120      | 001153   | -20           | 1120     | 00061    | +             | 2120     | 001316   | +18           | 3120     | 02707    | +5            | 4120     | 001832   | -2            |
| 140      | 1113     | 0             | 1140     | 66       | 3             | 2140     | 135      | 18            | 3140     | 716      | 4             | 4140     | 1793     | 20            |
| 160      | 1073     | 0             | 1160     | 7        | 4             | 2160     | 1389     | 18            | 3160     | 723      | 4             | 4160     | 1753     | 20            |
| 180      | 1033     | 20            | 1180     | 8        | 4             | 2180     | 1425     | 18            | 3180     | 730      | 3             | 4180     | 1713     | 0             |
| 200      | 994      | 2             | 1200     | 88       | 4             | 2200     | 1462     | 18            | 3200     | 736      | 3             | 4200     | 1673     | 20            |
| 220      | 00955    | -0            | 1220     | 00097    | +5            | 2220     | 001498   | +18           | 3220     | 0074     | +2            | 4220     | 001633   | -21           |
| 240      | 915      | 20            | 1240     | 107      | 6             | 2240     | 1535     | 18            | 3240     | 2744     |               | 4240     | 1591     | 21            |
| 260      | 877      | 19            | 1260     | 119      | 6             | 2260     | 1571     | 18            | 3260     | 2747     | 1             | 4260     | 1551     | 1             |
| 280      | 84       | 19            | 1280     | 131      | 7             | 2280     | 1607     | 18            | 3280     | 2748     | +1            | 4280     | 1509     | 21            |
| 300      | 80       | 19            | 1300     | 145      | 7             | 2300     | 1644     | 18            | 3300     | 749      | 0             | 4300     | 1468     | 1             |
| 320      | 000765   | -19           | 1320     | 000159   | +8            | 2320     | 001680   | +18           | 3320     | 002747   | -1            | 4320     | 001426   | -21           |
| 340      | 78       | 18            | 1340     | 175      | 8             | 2340     | 1716     | 18            | 3340     | 2745     | 2             | 4340     | 1384     | 21            |
| 360      | 693      | 18            | 1360     | 191      | 9             | 2360     | 1751     | 18            | 3360     | 2741     |               | 4360     | 1343     | 1             |
| 380      | 659      | 17            | 1380     | 209      | 9             | 2380     | 1787     | 18            | 3380     | 737      | 3             | 4380     | 130      | 21            |
| 400      | 625      | 17            | 1400     | 6        | 9             | 2400     | 1821     | 17            | 3400     | 2731     | 3             | 4400     | 1261     | 21            |
| 420      | 00059    | -16           | 1420     | 000246   | +10           | 2420     | 001856   | +18           | 3420     | 00724    | -4            | 4420     | 001219   | -21           |
| 440      | 560      | 16            | 1440     | 66       | 10            | 2440     | 1891     | 17            | 3440     | 2716     | 4             | 4440     | 1179     | 0             |
| 460      | 59       | 16            | 1460     | 87       | 11            | 2460     | 1925     | 17            | 3460     | 2707     | 5             | 4460     | 1138     | 20            |
| 480      | 498      | 15            | 1480     | 39       | 11            | 2480     | 1959     | 17            | 3480     | 2697     | 6             | 4480     | 1098     | 20            |
| 500      | 468      | 15            | 1500     | 331      | 1             | 2500     | 199      | 17            | 3500     | 2685     | 6             | 4500     | 1058     | 0             |
| 520      | 000440   | -14           | 1520     | 000355   | +12           | 2520     | 00205    | +16           | 3520     | 002672   | -7            | 4520     | 001018   | -20           |
| 540      | 411      | 14            | 1540     | 378      | 12            | 2540     | 057      | 16            | 3540     | 2659     | 7             | 4540     | 979      | 20            |
| 560      | 383      | 14            | 1560     | 404      | 13            | 2560     | 2090     | 16            | 3560     | 643      | 8             | 4560     | 939      | 2             |
| 580      | 357      | 13            | 1580     | 430      | 13            | 2580     | 211      | 16            | 3580     | 628      | 8             | 4580     | 900      | 19            |
| 600      | 332      | 1             | 1600     | 456      | 13            | 2600     | 152      | 15            | 3600     | 610      | 9             | 4600     | 86       | 19            |
| 620      | 000309   | -12           | 1620     | 000483   | +14           | 2620     | 002182   | +15           | 3620     | 00592    | -10           | 4620     | 000824   | -19           |
| 640      | 285      | 12            | 1640     | 511      | 14            | 2640     | 13       | 15            | 3640     | 57       | 10            | 4640     | 788      | 18            |
| 660      | 263      | 11            | 1660     | 539      | 14            | 2660     | 2243     | 15            | 3660     | 2552     | 11            | 4660     | 751      | 18            |
| 680      | 41       | 11            | 1680     | 568      | 15            | 2680     | 271      | 14            | 3680     | 530      | 11            | 4680     | 715      | 18            |
| 700      | 1        | 10            | 1700     | 597      | 15            | 2700     | 299      | 14            | 3700     | 2508     | 12            | 4700     | 681      | 17            |
| 720      | 0001     | -10           | 1720     | 000628   | +15           | 2720     | 00326    | +14           | 3720     | 00484    | -1            | 4720     | 000646   | -17           |
| 740      | 183      | 9             | 1740     | 658      | 16            | 2740     | 2353     | 14            | 3740     | 2459     | 13            | 4740     | 613      | 17            |
| 760      | 167      | 8             | 1760     | 690      | 16            | 2760     | 2380     | 13            | 3760     | 434      | 13            | 4760     | 579      | 17            |
| 780      | 151      | 8             | 1780     | 722      | 16            | 2780     | 405      | 1             | 3780     | 47       | 14            | 4780     | 547      | 16            |
| 800      | 136      | 7             | 1800     | 754      | 16            | 2800     | 429      | 12            | 3800     | 38       | 14            | 4800     | 517      | 15            |
| 820      | 0001     | -7            | 1820     | 000786   | +17           | 2820     | 002453   | +12           | 3820     | 002351   | -15           | 4820     | 000487   | -15           |
| 840      | 110      | 6             | 1840     | 80       | 17            | 2840     | 2476     | 12            | 3840     | 2322     | 15            | 4840     | 458      | 15            |
| 860      | 99       | 5             | 1860     | 853      | 17            | 2860     | 2499     | 11            | 3860     | 291      | 15            | 4860     | 428      | 15            |
| 880      | 90       | 5             | 1880     | 887      | 17            | 2880     | 2521     | 11            | 3880     | 2261     | 16            | 4880     | 400      | 14            |
| 900      | 81       | 4             | 1900     | 9        | 18            | 2900     | 541      | 10            | 3900     | 28       | 17            | 4900     | 373      | 13            |
| 920      | 000073   | -4            | 1920     | 000957   | +18           | 2920     | 002561   | +10           | 3920     | 002195   | -17           | 4920     | 000347   | -13           |
| 940      | 67       | 3             | 1940     | 99       | 18            | 2940     | 2579     | 9             | 3940     | 216      | 17            | 4940     | 323      | 12            |
| 960      | 6        |               | 1960     | 107      | 18            | 2960     | 598      | 9             | 3960     | 128      | 17            | 4960     | 299      | 12            |
| 980      | 58       | 2             | 1980     | 106      | 18            | 2980     | 2615     | 8             | 3980     | 2093     | 18            | 4980     | 276      | 11            |
| 1000     | 000054   | -2            | 2000     | 001098   | +18           | 3000     | 002631   | +8            | 4000     | 002058   | -18           | 5000     | 000254   | -11           |

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXVIII

Equation of Longitude

Argument N

| 1      | 2        | 3        | 1      | 2        | 3        | 1      | 2        | 3        |
|--------|----------|----------|--------|----------|----------|--------|----------|----------|
| N      | Equation | $\Delta$ | N      | Equation | $\Delta$ | N      | Equation | $\Delta$ |
| 1850°0 | 0°01763  | + 15     | 1900°0 | 0°01301  | - 22     | 1950°0 | 0°00681  | + 19     |
| 1°0    | 1776     | 11       | 1°0    | 1278     | 24       | 1°0    | 701      | 21       |
| 2°0    | 1784     | 10       | 2°0    | 1253     | 25       | 2°0    | 722      | 23       |
| 3°0    | 1795     | 9        | 3°0    | 1229     | 25       | 3°0    | 747      | 27       |
| 4°0    | 1801     | 6        | 4°0    | 1204     | 27       | 4°0    | 775      | 29       |
| 5°0    | 1806     | 6        | 5°0    | 1176     | 29       | 5°0    | 805      | 31       |
| 1856°0 | 0°01813  | + 7      | 1906°0 | 0°01146  | - 30     | 1956°0 | 0°00837  | + 33     |
| 7°0    | 1820     | 7        | 7°0    | 1116     | 32       | 7°0    | 870      | 34       |
| 8°0    | 1826     | 6        | 8°0    | 1083     | 33       | 8°0    | 905      | 35       |
| 9°0    | 1831     | 8        | 9°0    | 1050     | 34       | 9°0    | 940      | 36       |
| 1860°0 | 1841     | 10       | 1910°0 | 1016     | 36       | 1960°0 | 977      | 37       |
| 1861°0 | 0°01851  | + 9      | 1911°0 | 0°00979  | - 36     | 1961°0 | 0°01014  | + 36     |
| 2°0    | 1859     | 9        | 2°0    | 944      | 36       | 2°0    | 1049     | 36       |
| 3°0    | 1868     | 9        | 3°0    | 908      | 35       | 3°0    | 1085     | 35       |
| 4°0    | 1877     | 9        | 4°0    | 874      | 33       | 4°0    | 1118     | 32       |
| 5°0    | 1886     | 9        | 5°0    | 842      | 32       | 5°0    | 1149     | 33       |
| 1866°0 | 0°01895  | + 9      | 1916°0 | 0°00810  | - 32     | 1966°0 | 0°01183  | + 31     |
| 7°0    | 1903     | 8        | 7°0    | 779      | 29       | 7°0    | 1212     | 30       |
| 8°0    | 1911     | 7        | 8°0    | 752      | 26       | 8°0    | 1242     | 29       |
| 9°0    | 1917     | 6        | 9°0    | 728      | 23       | 9°0    | 1268     | 26       |
| 1870°0 | 1922     | 3        | 1920°0 | 706      | 21       | 1970°0 | 1294     | 26       |
| 1871°0 | 0°01923  | + 1      | 1921°0 | 0°00686  | - 19     | 1971°0 | 0°01320  | + 24     |
| 2°0    | 1923     | - 2      | 2°0    | 669      | 14       | 2°0    | 1342     | 23       |
| 3°0    | 1919     | 6        | 3°0    | 658      | 11       | 3°0    | 1366     | 23       |
| 4°0    | 1912     | 8        | 4°0    | 648      | 10       | 4°0    | 1388     | 23       |
| 5°0    | 1903     | 10       | 5°0    | 638      | 8        | 5°0    | 1412     | 25       |
| 1876°0 | 0°01892  | - 14     | 1926°0 | 0°00632  | - 5      | 1976°0 | 0°01438  | + 25     |
| 7°0    | 1876     | 18       | 7°0    | 628      | 3        | 7°0    | 1462     | 25       |
| 8°0    | 1857     | 20       | 8°0    | 627      | - 1      | 8°0    | 1487     | 26       |
| 9°0    | 1837     | 23       | 9°0    | 626      | 0        | 9°0    | 1514     | 28       |
| 1880°0 | 1812     | 26       | 1930°0 | 627      | + 1      | 1980°0 | 1543     | 30       |
| 1881°0 | 0°01786  | - 28     | 1931°0 | 0°00628  | + 1      | 1981°0 | 0°01573  | + 31     |
| 2°0    | 1757     | 28       | 2°0    | 628      | 2        | 2°0    | 1604     | 31       |
| 3°0    | 1730     | 29       | 3°0    | 631      | + 2      | 3°0    | 1635     | 34       |
| 4°0    | 1699     | 31       | 4°0    | 631      | 0        | 4°0    | 1671     | 35       |
| 5°0    | 1668     | 30       | 5°0    | 631      | 0        | 5°0    | 1704     | 34       |
| 1886°0 | 0°01640  | - 30     | 1936°0 | 0°00631  | - 1      | 1986°0 | 0°01738  | + 35     |
| 7°0    | 1608     | 31       | 7°0    | 630      | 1        | 7°0    | 1773     | 34       |
| 8°0    | 1579     | 28       | 8°0    | 629      | 2        | 8°0    | 1806     | 34       |
| 9°0    | 1552     | 28       | 9°0    | 627      | 2        | 9°0    | 1841     | 34       |
| 1890°0 | 1524     | 27       | 1940°0 | 626      | 1        | 1990°0 | 1873     | 31       |
| 1891°0 | 0°01499  | - 26     | 1941°0 | 0°00625  | - 3      | 1991°0 | 0°01903  | + 29     |
| 2°0    | 1472     | 26       | 2°0    | 621      | - 2      | 2°0    | 1931     | 28       |
| 3°0    | 1448     | 23       | 3°0    | 621      | + 2      | 3°0    | 1959     | 26       |
| 4°0    | 1426     | 22       | 4°0    | 625      | 3        | 4°0    | 1982     | 22       |
| 5°0    | 1404     | 22       | 5°0    | 626      | 4        | 5°0    | 2002     | 20       |
| 1896°0 | 0°01383  | - 21     | 1946°0 | 0°00632  | + 8      | 1996°0 | 0°02021  | + 17     |
| 7°0    | 1363     | 21       | 7°0    | 641      | 10       | 8°0    | 2035     | 12       |
| 8°0    | 1342     | 21       | 8°0    | 651      | 12       | 7°0    | 2044     | 9        |
| 9°0    | 1322     | 21       | 9°0    | 664      | 15       | 9°0    | 2053     | 8        |
| 1900°0 | 0°01301  | - 22     | 1950°0 | 0°00681  | + 19     | 2000°0 | 0°02059  | + 4      |

Applied Constant: +0°01400.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXIX

Equation of Longitude

Argument O

| O    | Equation | $\Delta$<br>o o <sub>1</sub> | O    | Equation | $\Delta$<br>o | O    | Equation | $\Delta$<br>i | O    | Equation | $\Delta$<br>d | O    | Equation | $\Delta$<br>o o |
|------|----------|------------------------------|------|----------|---------------|------|----------|---------------|------|----------|---------------|------|----------|-----------------|
| 0 00 | 0 04000  | -7                           | 1 00 | 0 099    | +13           | 2 00 | 0 05440  | +65           | 3 00 | 0 7369   | -37           | 4 00 | 0 01317  | -51             |
| 02   | 3861     | 70                           | 02   | 1 7      | 15            | 02   | 5569     | 64            | 02   | 7 94     | 39            | 02   | 1216     | 50              |
| 04   | 37 1     | 70                           | 04   | 16       | 18            | 04   | 5696     | 63            | 04   | 7 14     | 41            | 04   | 1118     | 48              |
| 06   | 3583     | 69                           | 06   | 198      |               | 06   | 58 1     | 6             | 06   | 713      | 44            | 06   | 1025     | 46              |
| 08   | 3444     | 69                           | 08   | 4        |               | 08   | 5944     | 61            | 08   | 7 4      | 45            | 08   | 935      | 45              |
| 10   | 33 7     | 69                           | 10   | 87       | 5             | 10   | 6064     | 60            | 10   | 6951     | 47            | 10   | 847      | 43              |
| 0 12 | 0 03170  | -68                          | 1 12 | 00339    | +7            | 2 12 | 0 0618   | +58           | 3 12 | 0 06856  | -49           | 4 12 | 0 00764  | -41             |
| 14   | 3 34     | 68                           | 14   | 395      | 9             | 14   | 6 97     | 57            | 14   | 6757     | 50            | 14   | 685      | 38              |
| 16   | 899      | 67                           | 16   | 455      | 31            | 16   | 64 9     | 55            | 16   | 6655     | 52            | 16   | 611      | 36              |
| 18   | 766      | 66                           | 18   | 5 0      | 34            | 18   | 6518     | 54            | 18   | 6550     | 53            | 18   | 54       | 34              |
| 20   | 634      | 66                           | 20   | 589      | 36            | 20   | 66 5     | 53            | 20   | 6442     | 55            | 20   | 474      | 3               |
| 0 22 | 0 02504  | -65                          | 1 22 | 0 0663   | +38           | 2 22 | 0 67 8   | +51           | 3 22 | 0 06330  | -57           | 4 22 | 0 00411  | -3              |
| 24   | 376      | 64                           | 24   | 740      | 40            | 24   | 68 7     | 49            | 24   | 6216     | 58            | 24   | 355      | 7               |
| 26   | 50       | 63                           | 26   | 8        | 4             | 26   | 69 3     | 47            | 26   | 6099     | 59            | 26   | 3        | 6               |
| 28   | 1 6      | 6                            | 28   | 907      | 44            | 28   | 7 16     | 45            | 28   | 5980     | 61            | 28   | 53       | 3               |
| 30   | 2004     | 61                           | 30   | 997      | 46            | 30   | 7104     | 43            | 30   | 5857     | 6             | 30   | 10       | 21              |
| 0 32 | 0 01885  | 59                           | 1 32 | 01090    | +47           | 2 32 | 0 07189  | +4            | 3 32 | 0 05733  | -63           | 4 32 | 0 00171  | -19             |
| 34   | 1768     | 58                           | 34   | 1186     | 49            | 34   | 727      | 40            | 34   | 5607     | 64            | 34   | 136      | 16              |
| 36   | 1654     | 56                           | 36   | 1 86     | 51            | 36   | 7347     | 38            | 36   | 5478     | 65            | 36   | 107      | 14              |
| 38   | 1543     | 55                           | 38   | 1390     | 53            | 38   | 7420     | 36            | 38   | 5348     | 66            | 38   | 81       | 11              |
| 40   | 1435     | 53                           | 40   | 1496     | 54            | 40   | 7489     | 33            | 40   | 5 16     | 66            | 40   | 62       | 9               |
| 0 42 | 0 1331   | -52                          | 1 42 | 01606    | +56           | 2 42 | 0 7553   | +31           | 3 42 | 0 05083  | -67           | 4 42 | 0 00 47  | -6              |
| 44   | 1 9      | 50                           | 44   | 1719     | 57            | 44   | 7613     | 9             | 44   | 4948     | 68            | 44   | 37       | 4               |
| 46   | 1131     | 48                           | 46   | 1836     | 58            | 46   | 7668     | 7             | 46   | 481      | 68            | 46   | 31       | 2               |
| 48   | 1 37     | 46                           | 48   | 195      | 59            | 48   | 7719     | 5             | 48   | 4675     | 69            | 48   | 31       | +1              |
| 50   | 946      | 45                           | 50   | 2 73     | 61            | 50   | 7766     | 2             | 50   | 4537     | 69            | 50   | 36       | 4               |
| 0 52 | 0 00858  | -43                          | 1 52 | 0 02196  | +6            | 2 52 | 0 078 7  | +20           | 3 52 | 04399    | -69           | 4 52 | 0 00045  | +6              |
| 54   | 775      | 41                           | 54   | 2321     | 63            | 54   | 7845     | 18            | 54   | 4260     | 70            | 54   | 60       | 8               |
| 56   | 696      | 39                           | 56   | 2449     | 64            | 56   | 7877     | 15            | 56   | 41 1     | 70            | 56   | 78       | 11              |
| 58   | 6 1      | 37                           | 58   | 578      | 65            | 58   | 7904     | 13            | 58   | 3981     | 70            | 58   | 10       | 13              |
| 60   | 550      | 35                           | 60   | 7 9      | 66            | 60   | 79 7     | 10            | 60   | 384      | 70            | 60   | 131      | 16              |
| 0 62 | 0 00483  | -33                          | 1 62 | 841      | +67           | 2 62 | 0 07945  | +8            | 3 62 | 0 03703  | -70           | 4 62 | 0 00164  | +18             |
| 64   | 42       | 3                            | 64   | 2975     | 68            | 64   | 7958     | 5             | 64   | 3564     | 70            | 64   | 203      | 21              |
| 66   | 363      | 28                           | 66   | 3111     | 68            | 66   | 7966     | +3            | 66   | 3425     | 69            | 66   | 246      | 23              |
| 68   | 3 9      | 6                            | 68   | 3247     | 69            | 68   | 7969     | 0             | 68   | 3288     | 69            | 68   | 293      | 25              |
| 70   | 60       | 23                           | 70   | 3385     | 69            | 70   | 7967     | -2            | 70   | 3151     | 68            | 70   | 346      | 27              |
| 0 72 | 0 00216  | -1                           | 1 72 | 0 035 3  | +69           | 2 72 | 0 7961   | -5            | 3 72 | 0 03 15  | -68           | 4 72 | 0 00403  | +29             |
| 74   | 176      | 19                           | 74   | 3661     | 7             | 74   | 7949     | 7             | 74   | 2881     | 67            | 74   | 463      | 32              |
| 76   | 141      | 16                           | 76   | 38 0     | 70            | 76   | 7933     | 9             | 76   | 2748     | 66            | 76   | 529      | 34              |
| 78   | 111      | 14                           | 78   | 394      | 7             | 78   | 7912     | 1             | 78   | 2616     | 65            | 78   | 598      | 36              |
| 80   | 85       | 1                            | 80   | 4079     | 7             | 80   | 7885     | 14            | 80   | 2487     | 64            | 80   | 673      | 38              |
| 0 82 | 00065    | -9                           | 1 82 | 0 04 18  | +70           | 2 82 | 0 07855  | -17           | 3 82 | 0 359    | -64           | 4 82 | 0 00750  | +4              |
| 84   | 49       | 7                            | 84   | 4357     | 7             | 84   | 7819     | 19            | 84   | 2233     | 63            | 84   | 833      | 42              |
| 86   | 38       | 4                            | 86   | 4496     | 69            | 86   | 7779     | 22            | 86   | 109      | 61            | 86   | 919      | 44              |
| 88   | 3        | -                            | 88   | 4634     | 69            | 88   | 7734     | 4             | 88   | 1988     | 60            | 88   | 1 9      | 46              |
| 90   | 31       | +1                           | 90   | 4771     | 69            | 90   | 7684     | 26            | 90   | 1869     | 58            | 90   | 1103     | 48              |
| 0 92 | 0 00035  | +3                           | 1 92 | 0 04908  | +68           | 2 92 | 7630     | -8            | 3 92 | 0 01753  | -58           | 4 92 | 0 01199  | +49             |
| 94   | 44       | 6                            | 94   | 5 43     | 67            | 94   | 7571     | 31            | 94   | 1639     | 56            | 94   | 130      | 51              |
| 96   | 58       | 8                            | 96   | 5177     | 67            | 96   | 7508     | 33            | 96   | 15 8     | 54            | 96   | 14 4     | 53              |
| 98   | 76       | 1                            | 98   | 5309     | 66            | 98   | 7441     | 35            | 98   | 1421     | 53            | 98   | 1510     | 54              |
| 1 00 | 0 00099  | +13                          | 2 00 | 0 0544   | +65           | 3 00 | 0 07369  | -37           | 4 00 | 0 1317   | -51           | 5 00 | 016 1    | +56             |



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

XXIX *continued*

Argument O

XXX

| 1    | 2        | 3                      | 1    | 2        | 3                      | 1    | 2        | 3                      |
|------|----------|------------------------|------|----------|------------------------|------|----------|------------------------|
| O    | Equation | $\Delta_{0d \cdot 01}$ | O    | Equation | $\Delta_{0d \cdot 01}$ | O    | Equation | $\Delta_{0d \cdot 01}$ |
| d    | o        |                        | d    | o        |                        | d    | o        |                        |
| 5.00 | 0.01621  | + 56                   | 6.00 | 0.07561  | + 31                   | 7.00 | 0.05065  | - 67                   |
| .02  | 1734     | 57                     | .02  | 7620     | 29                     | .02  | 4930     | 68                     |
| .04  | 1850     | 59                     | .04  | 7675     | 26                     | .04  | 4793     | 69                     |
| .06  | 1968     | 60                     | .06  | 7725     | 24                     | .06  | 4656     | 69                     |
| .08  | 2089     | 61                     | .08  | 7772     | 22                     | .08  | 4518     | 69                     |
| .10  | 2213     | 62                     | .10  | 7812     | 19                     | .10  | 4380     | 69                     |
| 5.12 | 0.02338  | + 63                   | 6.12 | 0.07849  | + 17                   | 7.12 | 0.04241  | - 70                   |
| .14  | 2466     | 65                     | .14  | 7881     | 15                     | .14  | 4102     | 70                     |
| .16  | 2596     | 65                     | .16  | 7907     | 12                     | .16  | 3962     | 70                     |
| .18  | 2727     | 66                     | .18  | 7929     | 10                     | .18  | 3823     | 70                     |
| .20  | 2859     | 67                     | .20  | 7947     | 8                      | .20  | 3684     | 70                     |
| 5.22 | 0.02993  | + 68                   | 6.22 | 0.07959  | + 5                    | 7.22 | 0.03545  | - 70                   |
| .24  | 3129     | 68                     | .24  | 7966     | + 3                    | .24  | 3406     | 69                     |
| .26  | 3265     | 69                     | .26  | 7969     | 0                      | .26  | 3269     | 68                     |
| .28  | 3403     | 69                     | .28  | 7966     | - 3                    | .28  | 3133     | 68                     |
| .30  | 3542     | 69                     | .30  | 7959     | 5                      | .30  | 2997     | 68                     |
| 5.32 | 0.03680  | + 69                   | 6.32 | 0.07947  | - 7                    | 7.32 | 0.02863  | - 67                   |
| .34  | 3819     | 70                     | .34  | 7930     | 10                     | .34  | 2730     | 66                     |
| .36  | 3959     | 70                     | .36  | 7908     | 12                     | .36  | 2598     | 65                     |
| .38  | 4098     | 70                     | .38  | 7881     | 15                     | .38  | 2469     | 64                     |
| .40  | 4237     | 70                     | .40  | 7850     | 17                     | .40  | 2342     | 63                     |
| 5.42 | 0.04376  | + 70                   | 6.42 | 0.07814  | - 19                   | 7.42 | 0.02216  | - 62                   |
| .44  | 4515     | 69                     | .44  | 7773     | 22                     | .44  | 2093     | 61                     |
| .46  | 4653     | 69                     | .46  | 7727     | 24                     | .46  | 1972     | 60                     |
| .48  | 4790     | 69                     | .48  | 7677     | 26                     | .48  | 1853     | 59                     |
| .50  | 4927     | 68                     | .50  | 7622     | 29                     | .50  | 1737     | 57                     |
| 5.52 | 0.05061  | + 67                   | 6.52 | 0.07562  | - 31                   | 7.52 | 0.01624  | - 56                   |
| .54  | 5195     | 67                     | .54  | 7499     | 33                     | .54  | 1513     | 55                     |
| .56  | 5327     | 66                     | .56  | 7431     | 35                     | .56  | 1406     | 53                     |
| .58  | 5458     | 65                     | .58  | 7359     | 37                     | .58  | 1303     | 51                     |
| .60  | 5586     | 64                     | .60  | 7283     | 39                     | .60  | 1203     | 50                     |
| 5.62 | 0.05713  | + 63                   | 6.62 | 0.07203  | - 41                   | 7.62 | 0.01105  | - 48                   |
| .64  | 5838     | 62                     | .64  | 7118     | 43                     | .64  | 1013     | 46                     |
| .66  | 5960     | 61                     | .66  | 7030     | 45                     | .66  | 923      | 44                     |
| .68  | 6080     | 60                     | .68  | 6938     | 47                     | .68  | 836      | 43                     |
| .70  | 6198     | 58                     | .70  | 6843     | 49                     | .70  | 753      | 40                     |
| 5.72 | 0.06312  | + 57                   | 6.72 | 0.06743  | - 51                   | 7.72 | 0.00675  | - 38                   |
| .74  | 6424     | 55                     | .74  | 6641     | 52                     | .74  | 601      | 36                     |
| .76  | 6533     | 54                     | .76  | 6535     | 54                     | .76  | 531      | 34                     |
| .78  | 6639     | 52                     | .78  | 6427     | 55                     | .78  | 465      | 32                     |
| .80  | 6741     | 50                     | .80  | 6314     | 57                     | .80  | 403      | 29                     |
| 5.82 | 0.06840  | + 49                   | 6.82 | 0.06200  | - 58                   | 7.82 | 0.00348  | - 26                   |
| .84  | 6936     | 47                     | .84  | 6083     | 59                     | .84  | 295      | 25                     |
| .86  | 7028     | 45                     | .86  | 5963     | 61                     | .86  | 247      | 23                     |
| .88  | 7116     | 43                     | .88  | 5840     | 62                     | .88  | 205      | 20                     |
| .90  | 7200     | 41                     | .90  | 5716     | 63                     | .90  | 166      | 18                     |
| 5.92 | 0.07280  | + 39                   | 6.92 | 0.05589  | - 64                   | 7.92 | 0.00132  | - 16                   |
| .94  | 7357     | 37                     | .94  | 5460     | 65                     | .94  | 103      | 14                     |
| .96  | 7429     | 35                     | .96  | 5330     | 66                     | .96  | 78       | 11                     |
| .98  | 7498     | 33                     | .98  | 5198     | 66                     | .98  | 60       | 8                      |
| 6.00 | 0.07561  | + 31                   | 7.00 | 0.05065  | - 67                   | 8.00 | 0.00046  | - 6                    |

Applied Constant: +0.04000.

| 1    | 2        | 3                      | 1    | 2        | 3                      |
|------|----------|------------------------|------|----------|------------------------|
| P    | Equation | $\Delta_{0d \cdot 01}$ | P    | Equation | $\Delta_{0d \cdot 01}$ |
| d    | o        |                        | d    | o        |                        |
| 0.00 | 0.00050  | + 0.8                  | 0.00 | 0.00050  | + 0.8                  |
| .08  | 56       | 0.8                    | .08  | 56       | 0.8                    |
| .16  | 62       | 0.8                    | .16  | 62       | 0.8                    |
| .24  | 68       | 0.7                    | .24  | 68       | 0.7                    |
| .32  | 73       | 0.6                    | .32  | 73       | 0.6                    |
| .40  | 78       | 0.6                    | .40  | 78       | 0.6                    |
| 0.48 | 0.00083  | + 0.6                  | 0.48 | 0.00083  | + 0.6                  |
| .56  | 87       | 0.4                    | .56  | 87       | 0.4                    |
| .64  | 90       | 0.3                    | .64  | 90       | 0.3                    |
| .72  | 92       | 0.2                    | .72  | 92       | 0.2                    |
| .80  | 93       | + 0.1                  | .80  | 93       | + 0.1                  |
| 0.88 | 0.00094  | 0.0                    | 0.88 | 0.00094  | 0.0                    |
| .96  | 94       | - 0.1                  | .96  | 94       | - 0.1                  |
| 1.04 | 93       | 0.2                    | 1.04 | 93       | 0.2                    |
| .12  | 91       | 0.3                    | .12  | 91       | 0.3                    |
| .20  | 88       | 0.4                    | .20  | 88       | 0.4                    |
| 1.28 | 0.00084  | - 0.5                  | 1.28 | 0.00084  | - 0.5                  |
| .36  | 80       | 0.6                    | .36  | 80       | 0.6                    |
| .44  | 75       | 0.6                    | .44  | 75       | 0.6                    |
| .52  | 70       | 0.7                    | .52  | 70       | 0.7                    |
| .60  | 64       | 0.8                    | .60  | 64       | 0.8                    |
| 1.68 | 0.00058  | - 0.8                  | 1.68 | 0.00058  | - 0.8                  |
| .76  | 52       | 0.8                    | .76  | 52       | 0.8                    |
| .84  | 46       | 0.8                    | .84  | 46       | 0.8                    |
| .92  | 40       | 0.8                    | .92  | 40       | 0.8                    |
| 2.00 | 34       | 0.8                    | 2.00 | 34       | 0.8                    |
| 2.08 | 0.00028  | - 0.7                  | 2.08 | 0.00028  | - 0.7                  |
| .16  | 23       | 0.6                    | .16  | 23       | 0.6                    |
| .24  | 19       | 0.5                    | .24  | 19       | 0.5                    |
| .32  | 15       | 0.5                    | .32  | 15       | 0.5                    |
| .40  | 11       | 0.4                    | .40  | 11       | 0.4                    |
| 2.48 | 0.00009  | - 0.3                  | 2.48 | 0.00009  | - 0.3                  |
| .56  | 7        | 0.2                    | .56  | 7        | 0.2                    |
| .64  | 6        | - 0.1                  | .64  | 6        | - 0.1                  |
| .72  | 6        | + 0.1                  | .72  | 6        | + 0.1                  |
| .80  | 7        | 0.2                    | .80  | 7        | 0.2                    |
| 2.88 | 0.00009  | + 0.3                  | 2.88 | 0.00009  | + 0.3                  |
| .96  | 11       | 0.3                    | .96  | 11       | 0.3                    |
| 3.04 | 14       | 0.4                    | 3.04 | 14       | 0.4                    |
| .12  | 18       | 0.6                    | .12  | 18       | 0.6                    |
| .20  | 23       | 0.6                    | .20  | 23       | 0.6                    |
| 3.28 | 0.00028  | + 0.7                  | 3.28 | 0.00028  | + 0.7                  |
| .36  | 34       | 0.8                    | .36  | 34       | 0.8                    |
| .44  | 40       | 0.8                    | .44  | 40       | 0.8                    |
| .52  | 46       | 0.8                    | .52  | 46       | 0.8                    |
| .60  | 52       | 0.8                    | .60  | 52       | 0.8                    |
| 3.68 | 0.00058  | + 0.8                  | 3.68 | 0.00058  | + 0.8                  |
| .76  | 64       | 0.8                    | .76  | 64       | 0.8                    |
| .84  | 70       | 0.7                    | .84  | 70       | 0.7                    |
| .92  | 75       | 0.6                    | .92  | 75       | 0.6                    |
| 4.00 | 0.00080  | + 0.6                  | 4.00 | 0.00080  | + 0.6                  |

Constant: +0.00050.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

XXXI

| Q                    | Equation | $\Delta_{0^d 0}$ | Q    | Equation | $\Delta_{0^d 01}$ |
|----------------------|----------|------------------|------|----------|-------------------|
| <sup>d</sup><br>0 00 | 0 0 600  | - 8 1            | 2 00 | 0 00771  | + 7 6             |
| 04                   | 567      | 8 1              | 04   | 801      | 7 4               |
| 08                   | 535      | 8 1              | 08   | 830      | 7 1               |
| 12                   | 502      | 8 1              | 12   | 858      | 6 9               |
| 16                   | 470      | 7 9              | 16   | 885      | 6 6               |
| 20                   | 439      | 7 6              | 20   | 911      | 6 2               |
| 0 24                 | 0 00409  | - 7 5            | 2 24 | 0 00935  | + 5 8             |
| 28                   | 379      | 7 4              | 28   | 957      | 5 4               |
| 32                   | 350      | 7 0              | 32   | 978      | 4 9               |
| 36                   | 3 3      | 6 6              | 36   | 996      | 4 4               |
| 40                   | 97       | 6 3              | 40   | 1 13     | 3 9               |
| 0 44                 | 0 00273  | - 5 9            | 2 44 | 0 01027  | + 3 4             |
| 48                   | 50       | 5 5              | 48   | 1040     | 2 9               |
| 52                   | 9        | 5 0              | 52   | 1050     | 3                 |
| 56                   | 1        | 4 6              | 56   | 1058     | 1 8               |
| 60                   | 192      | 4 1              | 60   | 1064     | 1 3               |
| 0 64                 | 0 00177  | - 3 5            | 2 64 | 0 01068  | + 0 6             |
| 68                   | 164      | 3 0              | 68   | 1069     | 0 0               |
| 72                   | 153      | 2 5              | 72   | 1 68     | - 0 6             |
| 76                   | 144      | 1 9              | 76   | 1064     | 1 1               |
| 80                   | 138      | 1 3              | 80   | 1059     | 1 5               |
| 0 84                 | 0 134    | - 8              | 2 84 | 0 01052  | - 2 1             |
| 88                   | 132      | - 0 3            | 88   | 104      | 2 9               |
| 92                   | 13       | + 0 4            | 92   | 1029     | 3 4               |
| 96                   | 135      | 0 9              | 96   | 1015     | 3 8               |
| 1 00                 | 139      | 1 4              | 3 00 | 999      | 4 3               |
| 1 04                 | 0 00146  | + 1              | 3 04 | 0 00980  | - 4 9             |
| 08                   | 156      | 8                | 08   | 960      | 5 3               |
| 12                   | 168      | 3 3              | 12   | 938      | 5 8               |
| 16                   | 182      | 3 8              | 16   | 914      | 6 3               |
| 20                   | 198      | 4 1              | 20   | 888      | 6 5               |
| 1 24                 | 0 00215  | + 4 6            | 3 24 | 0 00862  | - 6 8             |
| 28                   | 35       | 5                | 28   | 834      | 7 1               |
| 32                   | 57       | 5 6              | 32   | 8 5      | 7 4               |
| 36                   | 280      | 6 0              | 36   | 775      | 7 6               |
| 40                   | 305      | 6 4              | 40   | 744      | 7 8               |
| 1 44                 | 0 0 331  | + 6 6            | 3 44 | 0 00713  | - 7 9             |
| 48                   | 358      | 7                | 48   | 681      | 8 1               |
| 52                   | 387      | 7 4              | 52   | 648      | 8 2               |
| 56                   | 417      | 7 6              | 56   | 615      | 8 2               |
| 60                   | 448      | 7 9              | 60   | 58       | 8 2               |
| 1 64                 | 0 0 480  | + 8 0            | 3 64 | 0 0 549  | - 8 1             |
| 68                   | 51       | 8 0              | 68   | 517      | 8 0               |
| 72                   | 544      | 8 1              | 72   | 485      | 8 1               |
| 76                   | 577      | 8 2              | 76   | 45       | 7 9               |
| 80                   | 610      | 8                | 80   | 4 1      | 7 6               |
| 1 84                 | 0 00643  | + 8 1            | 3 84 | 0 00391  | - 7 4             |
| 88                   | 675      | 8 1              | 88   | 36       | 7 1               |
| 92                   | 7 8      | 8 1              | 92   | 334      | 6 8               |
| 96                   | 740      | 7 9              | 96   | 308      | 6 3               |
| 2 00                 | 0 00771  | + 7 6            | 4 00 | 0 84     | - 5 7             |

Appl d C t t + 00600

XXXII

| R    | Equation | $\Delta_{0^d 01}$ |
|------|----------|-------------------|
| 0 00 | 0 00100  | - 1 6             |
| 08   | 87       | 1 6               |
| 16   | 74       | 1 6               |
| 24   | 61       | 1 6               |
| 32   | 49       | 1 4               |
| 40   | 39       | 1 3               |
| 0 48 | 0 00029  | - 1 1             |
| 56   | 1        | 0 9               |
| 64   | 14       | 0 8               |
| 72   | 9        | 0 5               |
| 80   | 6        | - 0 3             |
| 0 88 | 0 00005  | 0 0               |
| 96   | 6        | + 0 2             |
| 1 04 | 8        | 0 4               |
| 12   | 12       | 0 6               |
| 20   | 18       | 0 9               |
| 1 28 | 0 00026  | + 1 1             |
| 36   | 35       | 1 2               |
| 44   | 45       | 1 4               |
| 52   | 57       | 1 5               |
| 60   | 69       | 1 6               |
| 1 68 | 0 00082  | + 1 6             |
| 76   | 95       | 1 7               |
| 84   | 109      | 1 7               |
| 92   | 1 2      | 1 6               |
| 2 00 | 134      | 1 5               |
| 2 08 | 0 00146  | + 1 5             |
| 16   | 158      | 1 4               |
| 24   | 168      | 1 1               |
| 32   | 176      | 1 0               |
| 40   | 184      | 0 9               |
| 2 48 | 0 00189  | + 0 6             |
| 56   | 193      | 0 4               |
| 64   | 195      | + 0 1             |
| 72   | 195      | - 0 1             |
| 80   | 193      | 0 4               |
| 2 88 | 0 00189  | - 0 6             |
| 96   | 184      | 0 8               |
| 3 04 | 177      | 1 0               |
| 12   | 168      | 1 1               |
| 20   | 159      | 1 3               |
| 3 28 | 0 00147  | - 1 5             |
| 36   | 135      | 1 5               |
| 44   | 1 3      | 1 6               |
| 52   | 110      | 1 7               |
| 60   | 96       | 1 7               |
| 3 68 | 0 00083  | - 1 6             |
| 76   | 70       | 1 6               |
| 84   | 58       | 1 5               |
| 92   | 46       | 1 4               |
| 4 00 | 0 00036  | - 1 2             |

C t t + 00 00

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

Equations of the Variation of the Radius Vector, Doubled.

XXXIII

XXXIV

XXXV

XXXVI

| 1    | 2             | 3                |
|------|---------------|------------------|
| A    | Equa-<br>tion | $\Delta$<br>od·r |
| d    |               |                  |
| 0·0  | -·00373       | -0,2             |
| ·2   | 375           | 1,8              |
| ·4   | 380           | 3,5              |
| ·6   | 389           | 5,5              |
| ·8   | 402           | 7,3              |
| 1·0  | 418           | 8,8              |
| 1·2  | -·00437       | -10,3            |
| ·4   | 459           | 11,5             |
| ·6   | 483           | 12,3             |
| ·8   | 508           | 12,0             |
| 2·0  | 531           | 11,3             |
| 2·2  | -·00553       | -10,5            |
| ·4   | 573           | 9,0              |
| ·6   | 589           | 7,3              |
| ·8   | 602           | 5,5              |
| 3·0  | 611           | 3,8              |
| 3·2  | -·00617       | -2,3             |
| ·4   | 620           | -1,0             |
| ·6   | 621           | +0,5             |
| ·8   | 618           | 2,0              |
| 4·0  | 613           | 3,5              |
| 4·2  | -·00604       | +5,3             |
| ·4   | 592           | 6,8              |
| ·6   | 577           | 8,5              |
| ·8   | 558           | 10,0             |
| 5·0  | 537           | 11,0             |
| 5·2  | -·00514       | +12,0            |
| ·4   | 489           | 12,3             |
| ·6   | 465           | 11,5             |
| ·8   | 443           | 10,5             |
| 6·0  | 423           | 9,3              |
| 6·2  | -·00406       | +7,5             |
| ·4   | 393           | 6,0              |
| ·6   | 382           | 4,3              |
| ·8   | 376           | 2,3              |
| 7·0  | 373           | +0,5             |
| 7·2  | -·00374       | -1,5             |
| ·4   | 379           | 3,0              |
| ·6   | 386           | 4,8              |
| ·8   | 398           | 7,0              |
| 8·0  | 414           | 8,8              |
| 8·2  | -·00433       | -10,0            |
| ·4   | 454           | 11,0             |
| ·6   | 477           | 11,8             |
| ·8   | 501           | 12,0             |
| 9·0  | 525           | 11,8             |
| 9·2  | -·00548       | -10,8            |
| ·4   | 568           | 9,3              |
| ·6   | 585           | 7,5              |
| ·8   | 598           | 6,0              |
| 10·0 | -·00609       | -4,5             |

Constant: -0·00500.

| 1    | 2             | 3                |
|------|---------------|------------------|
| B    | Equa-<br>tion | $\Delta$<br>od·r |
| d    |               |                  |
| 0·0  | +·00015       | 0,0              |
| 0·4  | 17            | +1,1             |
| 0·8  | 24            | 2,3              |
| 1·2  | 35            | 2,8              |
| 1·6  | 46            | 2,8              |
| 2·0  | 57            | 2,3              |
| 2·4  | +·00064       | +1,4             |
| 2·8  | 68            | +0,5             |
| 3·2  | 68            | -0,8             |
| 3·6  | 63            | 1,8              |
| 4·0  | 54            | 2,4              |
| 4·4  | +·00044       | -2,8             |
| 4·8  | 32            | 2,8              |
| 5·2  | 22            | 2,3              |
| 5·6  | 14            | 1,5              |
| 6·0  | 10            | -0,6             |
| 6·4  | +·00009       | +0,4             |
| 6·8  | 13            | 1,3              |
| 7·2  | 19            | 2,0              |
| 7·6  | 29            | 2,6              |
| 8·0  | 40            | 2,8              |
| 8·4  | +·00051       | +2,5             |
| 8·8  | 60            | 1,9              |
| 9·2  | 66            | +1,3             |
| 9·6  | 69            | 0,0              |
| 10·0 | 66            | -1,3             |
| 10·4 | +·00059       | -1,9             |
| 10·8 | 49            | 2,6              |
| 11·2 | 38            | 2,8              |
| 11·6 | 27            | 2,4              |
| 12·0 | 19            | 1,5              |
| 12·4 | +·00015       | -0,4             |
| 12·8 | 16            | +0,9             |
| 13·2 | 22            | 1,9              |
| 13·6 | 31            | 2,5              |
| 14·0 | 42            | 2,8              |
| 14·4 | +·00053       | +2,5             |
| 14·8 | 62            | 1,9              |
| 15·2 | 68            | +0,8             |
| 15·6 | 68            | -0,5             |
| 16·0 | 64            | 1,3              |
| 16·4 | +·00057       | -1,9             |
| 16·8 | 47            | 2,8              |
| 17·2 | 35            | 2,8              |
| 17·6 | 25            | 2,4              |
| 18·0 | 16            | 1,8              |
| 18·4 | +·00011       | -0,9             |
| 18·8 | 9             | 0,0              |
| 19·2 | 11            | +1,0             |
| 19·6 | 17            | 2,0              |
| 20·0 | +·00027       | +3,0             |

Constant: +0·00040.

| 1   | 2             | 3        | 1    | 2             | 3        |
|-----|---------------|----------|------|---------------|----------|
| D   | Equa-<br>tion | $\Delta$ | D    | Equa-<br>tion | $\Delta$ |
| d   |               |          | d    |               |          |
| 0·0 | +·00017       | 0        | 5·0  | +·00416       | -25      |
| ·1  | 18            | +2       | ·1   | 390           | 26       |
| ·2  | 22            | 4        | ·2   | 364           | 26       |
| ·3  | 27            | 6        | ·3   | 338           | 27       |
| ·4  | 35            | 9        | ·4   | 311           | 27       |
| ·5  | 46            | 11       | ·5   | 285           | 27       |
| 0·6 | +·00058       | +13      | 5·6  | +·00258       | -27      |
| ·7  | 72            | 15       | ·7   | 232           | 26       |
| ·8  | 89            | 17       | ·8   | 207           | 25       |
| ·9  | 107           | 18       | ·9   | 183           | 24       |
| 1·0 | 126           | 20       | 6·0  | 160           | 23       |
| 1·1 | +·00148       | +22      | 6·1  | +·00138       | -21      |
| ·2  | 170           | 23       | ·2   | 118           | 20       |
| ·3  | 194           | 24       | ·3   | 99            | 19       |
| ·4  | 218           | 25       | ·4   | 81            | 17       |
| ·5  | 244           | 26       | ·5   | 66            | 15       |
| 1·6 | +·00270       | +26      | 6·6  | +·00052       | -13      |
| ·7  | 296           | 27       | ·7   | 41            | 10       |
| ·8  | 323           | 27       | ·8   | 32            | 8        |
| ·9  | 349           | 27       | ·9   | 25            | 6        |
| 2·0 | 376           | 27       | 7·0  | 20            | 4        |
| 2·1 | +·00402       | +26      | 7·1  | +·00017       | -2       |
| ·2  | 427           | 25       | ·2   | 17            | +1       |
| ·3  | 452           | 24       | ·3   | 19            | 4        |
| ·4  | 475           | 23       | ·4   | 24            | 6        |
| ·5  | 497           | 22       | ·5   | 31            | 8        |
| 2·6 | +·00518       | +20      | 7·6  | +·00040       | +10      |
| ·7  | 537           | 19       | ·7   | 51            | 12       |
| ·8  | 555           | 17       | ·8   | 64            | 14       |
| ·9  | 571           | 15       | ·9   | 79            | 16       |
| 3·0 | 585           | 13       | 8·0  | 97            | 18       |
| 3·1 | +·00597       | +11      | 8·1  | +·00116       | +19      |
| ·2  | 606           | 9        | ·2   | 136           | 21       |
| ·3  | 614           | 7        | ·3   | 158           | 23       |
| ·4  | 619           | 4        | ·4   | 181           | 24       |
| ·5  | 622           | +2       | ·5   | 205           | 25       |
| 3·6 | +·00623       | -1       | 8·6  | +·00230       | +26      |
| ·7  | 621           | 3        | ·7   | 256           | 26       |
| ·8  | 617           | 5        | ·8   | 282           | 26       |
| ·9  | 611           | 7        | ·9   | 308           | 27       |
| 4·0 | 602           | 9        | 9·0  | 335           | 27       |
| 4·1 | +·00592       | -11      | 9·1  | +·00361       | +27      |
| ·2  | 579           | 14       | ·2   | 388           | 26       |
| ·3  | 564           | 16       | ·3   | 413           | 25       |
| ·4  | 547           | 18       | ·4   | 438           | 24       |
| ·5  | 529           | 19       | ·5   | 462           | 23       |
| 4·6 | +·00509       | -21      | 9·6  | +·00485       | +22      |
| ·7  | 488           | 22       | ·7   | 507           | 21       |
| ·8  | 465           | 23       | ·8   | 527           | 19       |
| ·9  | 441           | 24       | ·9   | 545           | 18       |
| 5·0 | +·00416       | -25      | 10·0 | +·00562       | +16      |

Applied Constant: +0·00320.

| 1    | 2             | 3                |
|------|---------------|------------------|
| E    | Equa-<br>tion | $\Delta$<br>od·r |
| d    |               |                  |
| 0·0  | +·00011       | 0,0              |
| ·2   | 13            | +2,0             |
| ·4   | 19            | 4,0              |
| ·6   | 29            | 5,8              |
| ·8   | 42            | 7,3              |
| 1·0  | 58            | 8,5              |
| 1·2  | +·00076       | +9,8             |
| ·4   | 97            | 10,8             |
| ·6   | 119           | 11,0             |
| ·8   | 141           | 11,3             |
| 2·0  | 164           | 11,3             |
| 2·2  | +·00186       | +10,5            |
| ·4   | 206           | 9,5              |
| ·6   | 224           | 8,5              |
| ·8   | 240           | 7,3              |
| 3·0  | 253           | 5,5              |
| 3·2  | +·00262       | +3,5             |
| ·4   | 267           | +1,8             |
| ·6   | 269           | 0,0              |
| ·8   | 267           | -2,3             |
| 4·0  | 260           | 4,3              |
| 4·2  | +·00250       | -5,8             |
| ·4   | 237           | 7,5              |
| ·6   | 220           | 9,0              |
| ·8   | 201           | 9,8              |
| 5·0  | 181           | 10,5             |
| 5·2  | +·00159       | -11,3            |
| ·4   | 136           | 11,3             |
| ·6   | 114           | 11,0             |
| ·8   | 92            | 10,5             |
| 6·0  | 72            | 9,5              |
| 6·2  | +·00054       | -8,5             |
| ·4   | 38            | 7,0              |
| ·6   | 26            | 5,3              |
| ·8   | 17            | 3,5              |
| 7·0  | 12            | -1,5             |
| 7·2  | +·00011       | +0,5             |
| ·4   | 14            | 2,5              |
| ·6   | 21            | 4,3              |
| ·8   | 31            | 6,0              |
| 8·0  | 45            | 7,8              |
| 8·2  | +·00062       | +9,0             |
| ·4   | 81            | 10,0             |
| ·6   | 102           | 10,8             |
| ·8   | 124           | 11,0             |
| 9·0  | 146           | 11,3             |
| 9·2  | +·00169       | +11,0            |
| ·4   | 190           | 10,3             |
| ·6   | 210           | 9,5              |
| ·8   | 228           | 8,3              |
| 10·0 | +·00243       | +6,8             |

Constant: +0·00140.

The sum of the Equations of Tables XXXIII-XXXVI gives the Variation.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXXVII

Equation of Latitude

Argument O

| O    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | O    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | O    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ | O    | Equation | $\Delta$ | $\frac{1}{2}\Delta^2$ |
|------|----------|----------|-----------------------|------|----------|----------|-----------------------|------|----------|----------|-----------------------|------|----------|----------|-----------------------|
| 0 00 | 9000     | +740     |                       | 1 00 | 1 54888  | +474     | - 3                   | 2 00 | 1 72909  | -137     | - 3                   | 3 00 | 1 3 918  | -648     | - 2                   |
| 02   | 91479    | 74       | 0                     | 02   | 1 558 6  | 464      | 3                     | 02   | 1 7 62   | 150      | 3                     | 02   | 1 9617   | 654      | 2                     |
| 04   | 9 959    | 739      | 0                     | 04   | 1 56743  | 453      | 3                     | 04   | 1 7 311  | 162      | 3                     | 04   | 1 8304   | 660      |                       |
| 06   | 94437    | 739      |                       | 06   | 1 57639  | 443      | 3                     | 06   | 1 71973  | 175      | 3                     | 06   | 1 6978   | 666      | 1                     |
| 08   | 95914    | 738      | 0                     | 08   | 1 58515  | 433      | 3                     | 08   | 1 71610  | 188      | 3                     | 08   | 1 564    | 671      | 1                     |
| 10   | 97388    | 737      | 0                     | 10   | 1 59369  | 4        | 3                     | 10   | 1 71     | 1        | 3                     | 10   | 1 4 94   | 676      | 1                     |
| 0 12 | 0 98861  | +736     |                       | 1 12 | 1 60 0   | +411     | - 3                   | 2 12 | 1 70808  | -213     | - 3                   | 3 12 | 1 2 937  | -681     | - 1                   |
| 14   | 1 0 331  | 734      | 0                     | 14   | 1 61013  | 400      | 3                     | 14   | 1 70369  | 6        | 3                     | 14   | 1 21569  | 686      | 1                     |
| 16   | 1 01798  | 733      | 0                     | 16   | 1 61803  | 389      | 3                     | 16   | 1 69905  | 38       | 3                     | 16   | 1 0192   | 691      | 1                     |
| 18   | 1 3 6    | 731      | - 1                   | 18   | 1 6 57   | 378      | 3                     | 18   | 1 69417  | 250      | 3                     | 18   | 1 18806  | 696      | 1                     |
| 20   | 1 047 1  | 7 8      | 1                     | 20   | 1 63315  | 367      | 3                     | 20   | 1 68905  | 263      | 3                     | 20   | 1 17410  | 700      | 1                     |
| 0 22 | 1 06176  | +7 6     | - 1                   | 1 22 | 1 64038  | +356     | - 3                   | 2 22 | 1 68368  | -275     | - 3                   | 3 22 | 1 16005  | -704     | - 1                   |
| 24   | 1 76 6   | 7 4      | 1                     | 24   | 1 64737  | 344      | 3                     | 24   | 1 67806  | 287      | 3                     | 24   | 1 14593  | 708      | 1                     |
| 26   | 1 9 69   | 7 1      | 1                     | 26   | 1 65414  | 333      | 3                     | 26   | 1 67 1   | 99       | 3                     | 26   | 1 13174  | 711      | 1                     |
| 28   | 1 105 8  | 718      | 1                     | 28   | 1 66067  | 3 1      | 3                     | 28   | 1 66611  | 311      | 3                     | 28   | 1 11748  | 715      | 1                     |
| 30   | 1 11941  | 715      | 1                     | 30   | 1 66697  | 309      | 3                     | 30   | 1 65979  | 3        | 3                     | 30   | 1 10315  | 718      | 1                     |
| 0 32 | 1 13367  | +711     | - 1                   | 1 32 | 1 6730   | +297     | - 3                   | 2 32 | 1 653 2  | -334     | - 3                   | 3 32 | 1 08876  | -721     | - 1                   |
| 34   | 1 14786  | 708      | 1                     | 34   | 1 67884  | 85       | 3                     | 34   | 1 64643  | 346      | 3                     | 34   | 1 07431  | 724      | 1                     |
| 36   | 1 16197  | 704      | 1                     | 36   | 1 68441  | 73       | 3                     | 36   | 1 6394   | 357      | 3                     | 36   | 1 05980  | 7 7      | 1                     |
| 38   | 1 17600  | 700      | 1                     | 38   | 1 68975  | 261      | 3                     | 38   | 1 63 15  | 368      | 3                     | 38   | 1 045 4  | 7 9      | 1                     |
| 40   | 1 18995  | 695      | 1                     | 40   | 1 69484  | 49       | 3                     | 40   | 1 6 467  | 380      | 3                     | 40   | 1 03 64  | 731      | 1                     |
| 0 42 | 1 0380   | +690     | - 1                   | 1 42 | 1 69969  | + 36     | - 3                   | 2 42 | 1 61696  | -391     | - 3                   | 3 42 | 1 016 0  | -733     | - 1                   |
| 44   | 1 1756   | 686      | 1                     | 44   | 1 704 9  | 224      | 3                     | 44   | 1 609 4  | 402      | 3                     | 44   | 1 00133  | 735      | 0                     |
| 46   | 1 231    | 681      | 1                     | 46   | 1 70863  | 211      | 3                     | 46   | 1 60089  | 413      | 3                     | 46   | 0 98662  | 736      | 0                     |
| 48   | 1 4479   | 676      | 1                     | 48   | 1 71 73  | 199      | 3                     | 48   | 1 59 53  | 4 3      | 3                     | 48   | 97189    | 737      | 0                     |
| 50   | 1 58 5   | 670      |                       | 50   | 1 71659  | 187      | 3                     | 50   | 1 58396  | 434      | 3                     | 50   | 95713    | 738      | 0                     |
| 0 52 | 1 7160   | +664     | - 1                   | 1 52 | 1 7 019  | +174     | - 3                   | 2 52 | 1 57518  | -445     | - 3                   | 3 52 | 0 94 37  | -739     | 0                     |
| 54   | 1 2848   | 659      | 1                     | 54   | 1 7 354  | 161      | 3                     | 54   | 1 56618  | 455      | 3                     | 54   | 9 757    | 740      |                       |
| 56   | 1 29794  | 653      |                       | 56   | 1 7 663  | 148      | 3                     | 56   | 1 55699  | 465      | 3                     | 56   | 91 78    | 740      | 0                     |
| 58   | 1 31094  | 646      | 2                     | 58   | 1 72947  | 135      | 3                     | 58   | 1 54758  | 475      | 3                     | 58   | 89799    | 740      | 0                     |
| 60   | 1 3 381  | 640      | 2                     | 60   | 1 73 4   | 1        | 3                     | 60   | 1 53799  | 485      | 3                     | 60   | 88319    | 740      | 0                     |
| 0 62 | 1 33655  | +634     | - 2                   | 1 62 | 1 73436  | +110     | - 3                   | 2 62 | 1 5282   | -495     | - 2                   | 3 62 | 0 86841  | -739     | 0                     |
| 64   | 1 34915  | 6 7      | 2                     | 64   | 1 73643  | 97       | 3                     | 64   | 1 51821  | 504      | 2                     | 64   | 85362    | 739      | 0                     |
| 66   | 1 36161  | 620      |                       | 66   | 1 73824  | 84       | 3                     | 66   | 1 50804  | 513      | 2                     | 66   | 83886    | 738      | 0                     |
| 68   | 1 37394  | 613      |                       | 68   | 1 73978  | 7        | 3                     | 68   | 1 49768  | 5 3      | 2                     | 68   | 8 411    | 737      | 0                     |
| 70   | 1 38611  | 605      |                       | 70   | 1 741 8  | 58       | 3                     | 70   | 1 48713  | 53       | 2                     | 70   | 80939    | 736      | 0                     |
| 0 72 | 1 39814  | +598     | -                     | 1 72 | 1 74210  | + 45     | - 3                   | 2 72 | 1 47640  | -541     | - 2                   | 3 72 | 0 79469  | -735     | 0                     |
| 74   | 1 410 1  | 590      |                       | 74   | 1 74 86  | 32       | 3                     | 74   | 1 46549  | 55       |                       | 74   | 78001    | 733      | + 1                   |
| 76   | 1 4 173  | 58       |                       | 76   | 1 74336  | 19       | 3                     | 76   | 1 45441  | 558      | 2                     | 76   | 76538    | 730      | 1                     |
| 78   | 1 433 8  | 574      | 2                     | 78   | 1 74360  | + 6      | 3                     | 78   | 1 44316  | 567      | 2                     | 78   | 75 80    | 728      | 1                     |
| 80   | 1 44468  | 566      | 2                     | 80   | 1 74358  | - 8      | 3                     | 80   | 1 43174  | 575      | 2                     | 80   | 73626    | 726      | 1                     |
| 0 82 | 1 45591  | +558     | -                     | 1 82 | 1 74330  | - 20     | - 3                   | 2 82 | 1 42016  | -583     | - 2                   | 3 82 | 0 7 178  | -7 3     | + 1                   |
| 84   | 1 46698  | 549      |                       | 84   | 1 74 77  | 33       | 3                     | 84   | 1 4084   | 591      | 2                     | 84   | 70734    | 721      | 1                     |
| 86   | 1 47786  | 540      | 2                     | 86   | 1 74197  | 47       | 3                     | 86   | 1 3965   | 599      | 2                     | 86   | 69296    | 718      | 1                     |
| 88   | 1 48856  | 531      |                       | 88   | 1 74 90  | 6        | 3                     | 88   | 1 38448  | 606      | 2                     | 88   | 67864    | 714      | 1                     |
| 90   | 1 49908  | 52       |                       | 90   | 1 73958  | 73       | 3                     | 90   | 1 37227  | 614      | 2                     | 90   | 66439    | 711      | 1                     |
| 0 92 | 1 5094   | +51      | - 2                   | 1 92 | 1 73799  | - 86     | - 3                   | 2 92 | 1 35993  | -6 1     | - 2                   | 3 92 | 0 65022  | -7 7     | + 1                   |
| 94   | 1 51957  | 503      |                       | 94   | 1 73616  | 98       | 3                     | 94   | 1 34745  | 6 8      | 2                     | 94   | 63612    | 703      | 1                     |
| 96   | 1 5 953  | 493      |                       | 96   | 1 734 6  | 111      | 3                     | 96   | 1 33483  | 635      | 2                     | 96   | 6 11     | 699      | 1                     |
| 98   | 1 5393   | 484      |                       | 98   | 1 73171  | 1 4      | 3                     | 98   | 1 32207  | 641      | 2                     | 98   | 60818    | 695      | 1                     |
| 1 00 | 1 54888  | +474     | - 3                   | 2 00 | 1 7 9 9  | -137     | - 3                   | 3 00 | 1 30918  | -648     | - 2                   | 4 00 | 0 59433  | -690     | + 1                   |

Appl d O t t + 000

F Elp

T bl XXXVIII XLII F th th ph m T bl XLIII XLIV m t l i ppl d

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXXVII continued

Equation of Latitude

Argument O

| 1    | 2        | 3                              | 4                      | 1    | 2        | 3                              | 4                      | 1    | 2        | 3                              | 4                      | 1    | 2        | 3                              | 4                      |
|------|----------|--------------------------------|------------------------|------|----------|--------------------------------|------------------------|------|----------|--------------------------------|------------------------|------|----------|--------------------------------|------------------------|
| O    | Equation | $\Delta$<br>0 <sup>d</sup> .01 | $\frac{1}{2} \Delta^2$ | O    | Equation | $\Delta$<br>0 <sup>d</sup> .01 | $\frac{1}{2} \Delta^2$ | O    | Equation | $\Delta$<br>0 <sup>d</sup> .01 | $\frac{1}{2} \Delta^2$ | O    | Equation | $\Delta$<br>0 <sup>d</sup> .01 | $\frac{1}{2} \Delta^2$ |
| d    |          |                                |                        | d    |          |                                |                        | d    |          |                                |                        | d    |          |                                |                        |
| 4.00 | 0.59433  | -690                           | + 1                    | 5.00 | 0.09967  | -235                           | + 3                    | 6.00 | 0.18410  | +392                           | + 3                    | 7.00 | 0.78599  | +733                           | 0                      |
| .02  | .58058   | 685                            | 1                      | .02  | .9510    | 222                            | 3                      | .02  | .19206   | 403                            | 3                      | .02  | .80067   | 735                            | 0                      |
| .04  | .56692   | 680                            | 1                      | .04  | .9078    | 210                            | 3                      | .04  | .20023   | 414                            | 3                      | .04  | .81538   | 736                            | 0                      |
| .06  | .55338   | 675                            | 1                      | .06  | .8671    | 197                            | 3                      | .06  | .20862   | 425                            | 3                      | .06  | .83012   | 737                            | 0                      |
| .08  | .53993   | 670                            | 1                      | .08  | .8289    | 185                            | 3                      | .08  | .21722   | 436                            | 3                      | .08  | .84487   | 738                            | 0                      |
| .10  | .52660   | 664                            | 2                      | .10  | .7933    | 172                            | 3                      | .10  | .22604   | 446                            | 3                      | .10  | .85965   | 739                            | 0                      |
| 4.12 | 0.51338  | -658                           | + 2                    | 5.12 | 0.07602  | -159                           | + 3                    | 6.12 | 0.23505  | +456                           | + 3                    | 7.12 | 0.87443  | +740                           | 0                      |
| .14  | .50028   | 652                            | 2                      | .14  | .7296    | 147                            | 3                      | .14  | .24427   | 466                            | 3                      | .14  | .88924   | 740                            | 0                      |
| .16  | .48730   | 646                            | 2                      | .16  | .7016    | 134                            | 3                      | .16  | .25369   | 476                            | 3                      | .16  | .90403   | 740                            | 0                      |
| .18  | .47445   | 639                            | 2                      | .18  | .6761    | 121                            | 3                      | .18  | .26332   | 486                            | 3                      | .18  | .91882   | 740                            | 0                      |
| .20  | .46173   | 633                            | 2                      | .20  | .6533    | 108                            | 3                      | .20  | .27314   | 496                            | 2                      | .20  | .93361   | 739                            | 0                      |
| 4.22 | 0.44915  | -626                           | + 2                    | 5.22 | 0.06330  | -95                            | + 3                    | 6.22 | 0.28315  | +505                           | + 2                    | 7.22 | 0.94838  | +739                           | 0                      |
| .24  | .43670   | 619                            | 2                      | .24  | .6155    | 82                             | 3                      | .24  | .29335   | 515                            | 2                      | .24  | .96315   | 738                            | 0                      |
| .26  | .42440   | 612                            | 2                      | .26  | .6004    | 69                             | 3                      | .26  | .30374   | 524                            | 2                      | .26  | .97789   | 737                            | 0                      |
| .28  | .41224   | 604                            | 2                      | .28  | .5879    | 56                             | 3                      | .28  | .31431   | 533                            | 2                      | .28  | .99262   | 736                            | 0                      |
| .30  | .40024   | 597                            | 2                      | .30  | .5779    | 43                             | 3                      | .30  | .32506   | 542                            | 2                      | .30  | 1.00732  | 734                            | - 1                    |
| 4.32 | 0.38838  | -589                           | + 2                    | 5.32 | 0.05706  | -30                            | + 3                    | 6.32 | 0.33599  | +551                           | + 2                    | 7.32 | 1.02198  | +732                           | - 1                    |
| .34  | .37669   | 581                            | 2                      | .34  | .5659    | 17                             | 3                      | .34  | .34709   | 560                            | 2                      | .34  | 1.03660  | 730                            | - 1                    |
| .36  | .36513   | 573                            | 2                      | .36  | .5638    | - 4                            | 3                      | .36  | .35837   | 568                            | 2                      | .36  | 1.05118  | 728                            | - 1                    |
| .38  | .35377   | 564                            | 2                      | .38  | .5643    | + 9                            | 3                      | .38  | .36981   | 576                            | 2                      | .38  | 1.06572  | 726                            | - 1                    |
| .40  | .34256   | 557                            | 2                      | .40  | .5674    | 22                             | 3                      | .40  | .38142   | 585                            | 2                      | .40  | 1.08020  | 723                            | - 1                    |
| 4.42 | 0.33152  | -548                           | + 2                    | 5.42 | 0.05731  | + 36                           | + 3                    | 6.42 | 0.39319  | +592                           | + 2                    | 7.42 | 1.09462  | +720                           | - 1                    |
| .44  | .32066   | 539                            | 2                      | .44  | .5816    | 49                             | 3                      | .44  | .40510   | 600                            | 2                      | .44  | 1.10899  | 717                            | - 1                    |
| .46  | .30998   | 530                            | 2                      | .46  | .5925    | 61                             | 3                      | .46  | .41718   | 608                            | 2                      | .46  | 1.12330  | 714                            | - 1                    |
| .48  | .29948   | 520                            | 2                      | .48  | .6060    | 74                             | 3                      | .48  | .42940   | 615                            | 2                      | .48  | 1.13755  | 710                            | - 1                    |
| .50  | .28917   | 511                            | 2                      | .50  | .6221    | 87                             | 3                      | .50  | .44177   | 622                            | 2                      | .50  | 1.15171  | 706                            | - 1                    |
| 4.52 | 0.27905  | -501                           | + 2                    | 5.52 | 0.06409  | +100                           | + 3                    | 6.52 | 0.45427  | +629                           | + 2                    | 7.52 | 1.16580  | +703                           | - 1                    |
| .54  | .26912   | 492                            | 2                      | .54  | .6623    | 113                            | 3                      | .54  | .46691   | 635                            | 2                      | .54  | 1.17981  | 699                            | - 1                    |
| .56  | .25937   | 482                            | 3                      | .56  | .6862    | 126                            | 3                      | .56  | .47968   | 642                            | 2                      | .56  | 1.19374  | 694                            | - 1                    |
| .58  | .24983   | 472                            | 3                      | .58  | .7126    | 139                            | 3                      | .58  | .49258   | 648                            | 2                      | .58  | 1.20757  | 689                            | - 1                    |
| .60  | .24049   | 462                            | 3                      | .60  | .7417    | 152                            | 3                      | .60  | .50561   | 655                            | 2                      | .60  | 1.22130  | 684                            | - 1                    |
| 4.62 | 0.23135  | -451                           | + 3                    | 5.62 | 0.07733  | +165                           | + 3                    | 6.62 | 0.51876  | +660                           | + 1                    | 7.62 | 1.23493  | +679                           | - 1                    |
| .64  | .22241   | 442                            | 3                      | .64  | .8075    | 177                            | 3                      | .64  | .53202   | 666                            | 2                      | .64  | 1.24847  | 674                            | - 1                    |
| .66  | .21369   | 431                            | 3                      | .66  | .8442    | 190                            | 3                      | .66  | .54540   | 672                            | 1                      | .66  | 1.26189  | 669                            | - 1                    |
| .68  | .20517   | 421                            | 3                      | .68  | .8834    | 202                            | 3                      | .68  | .55889   | 677                            | 1                      | .68  | 1.27521  | 663                            | - 2                    |
| .70  | .19687   | 410                            | 3                      | .70  | .9251    | 215                            | 3                      | .70  | .57248   | 682                            | 1                      | .70  | 1.28841  | 657                            | - 2                    |
| 4.72 | 0.18878  | -399                           | + 3                    | 5.72 | 0.09694  | +228                           | + 3                    | 6.72 | 0.58617  | +687                           | + 1                    | 7.72 | 1.30149  | +651                           | - 2                    |
| .74  | .18092   | 388                            | 3                      | .74  | .10161   | 240                            | 3                      | .74  | .59996   | 692                            | 1                      | .74  | 1.31445  | 645                            | - 2                    |
| .76  | .17328   | 376                            | 3                      | .76  | .10652   | 252                            | 3                      | .76  | .61384   | 696                            | 1                      | .76  | 1.32728  | 638                            | - 2                    |
| .78  | .16587   | 365                            | 3                      | .78  | .11167   | 264                            | 3                      | .78  | .62781   | 701                            | 1                      | .78  | 1.33998  | 632                            | - 2                    |
| .80  | .15867   | 354                            | 3                      | .80  | .11708   | 276                            | 3                      | .80  | .64186   | 705                            | 1                      | .80  | 1.35255  | 625                            | - 2                    |
| 4.82 | 0.15170  | -343                           | + 3                    | 5.82 | 0.12272  | +288                           | + 3                    | 6.82 | 0.65599  | +708                           | + 1                    | 7.82 | 1.36498  | +618                           | - 2                    |
| .84  | .14497   | 331                            | 3                      | .84  | .12861   | 300                            | 3                      | .84  | .67019   | 712                            | 1                      | .84  | 1.37726  | 611                            | - 2                    |
| .86  | .13847   | 319                            | 3                      | .86  | .13473   | 312                            | 3                      | .86  | .68447   | 716                            | 1                      | .86  | 1.38940  | 603                            | - 2                    |
| .88  | .13221   | 307                            | 3                      | .88  | .14110   | 324                            | 3                      | .88  | .69881   | 719                            | 1                      | .88  | 1.40138  | 596                            | - 2                    |
| .90  | .12618   | 295                            | 3                      | .90  | .14769   | 335                            | 3                      | .90  | .71321   | 721                            | 1                      | .90  | 1.41322  | 588                            | - 2                    |
| 4.92 | 0.12040  | -283                           | + 3                    | 5.92 | 0.15451  | +346                           | + 3                    | 6.92 | 0.72766  | +724                           | + 1                    | 7.92 | 1.42489  | +580                           | - 2                    |
| .94  | .11485   | 271                            | 3                      | .94  | .16156   | 358                            | 3                      | .94  | .74218   | 727                            | 1                      | .94  | 1.43641  | 572                            | - 2                    |
| .96  | .10955   | 259                            | 3                      | .96  | .16885   | 370                            | 3                      | .96  | .75674   | 729                            | + 1                    | .96  | 1.44775  | 563                            | - 2                    |
| .98  | .10448   | 247                            | 3                      | .98  | .17637   | 381                            | 3                      | .98  | .77135   | 731                            | 0                      | .98  | 1.45893  | 555                            | - 2                    |
| 5.00 | 0.09967  | -235                           | + 3                    | 6.00 | 0.18410  | +392                           | + 3                    | 7.00 | 0.78599  | +733                           | 0                      | 8.00 | 1.46994  | +546                           | - 2                    |

Applied Constant: +0.90000.

For Eclipses, and as the argument of Table XLV, the Equation of this Table must be supplemented by those of Tables XXXVIII-XLIII. For the other phenomena Tables XLIII, XLIV must also be applied.

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XXXVIII

Equation of Latitude

Argument S

| S                    | Equation | 3        |                        | S    | Equation | 3        |                        | S    | Equation | 3        |                        | S                    | Equation | 3        |                        |
|----------------------|----------|----------|------------------------|------|----------|----------|------------------------|------|----------|----------|------------------------|----------------------|----------|----------|------------------------|
|                      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |                      |          | $\Delta$ | $\frac{1}{2} \Delta^2$ |
| <sup>d</sup><br>0 00 | 0 08 00  | +43 8    | 0                      | 2 00 | 0 1 897  | - 8 1    | - 2                    | 4 00 | 0 06 190 | -40 8    | + 1                    | <sup>d</sup><br>6 00 | 0 03773  | +23 3    | + 2                    |
| 04                   | 8 175    | 43 8     | 0                      | 04   | 1286     | 9 6      |                        | 04   | 60 8     | 40       | 1                      | 04                   | 3868     | 24 4     |                        |
| 08                   | 8350     | 43 8     |                        | 08   | 1 8 0    | 11 1     |                        | 08   | 5868     | 39 6     | 1                      | 08                   | 3968     | 25 6     |                        |
| 12                   | 85 5     | 43 5     | 0                      | 12   | 12773    | 1 5      |                        | 12   | 5711     | 38 9     | 1                      | 12                   | 4073     | 6 9      | 1                      |
| 16                   | 8698     | 43 3     | 0                      | 16   | 1 7      | 14 1     | 2                      | 16   | 5557     | 38 1     | 1                      | 16                   | 4183     | 8 0      | 2                      |
| 20                   | 8871     | 43 0     |                        | 20   | 1 66     | 15 5     |                        | 20   | 5406     | 37 4     | 1                      | 20                   | 4297     | 29 3     | 1                      |
| 0 24                 | 0 0904   | +4 8     | 0                      | 2 24 | 12596    | -16 8    | -                      | 4 24 | 0 05 58  | -36 5    | + 1                    | 6 24                 | 0 04417  | +3 4     | + 1                    |
| 28                   | 9 13     | 4 5      | - 1                    | 28   | 12526    | 18 3     |                        | 28   | 5114     | 35 6     | 1                      | 28                   | 4540     | 31 5     | 1                      |
| 32                   | 938      | 42 1     | 1                      | 32   | 1 45     | 19 8     | 2                      | 32   | 4973     | 34 8     | 1                      | 32                   | 4669     | 32 6     | 1                      |
| 36                   | 9550     | 41 6     | 1                      | 36   | 12368    | 21 0     | 2                      | 36   | 4836     | 33 9     | 1                      | 36                   | 4801     | 33 5     | 1                      |
| 40                   | 9715     | 41 0     | 1                      | 40   | 1 28     | 2 3      |                        | 40   | 4702     | 3 8      | 1                      | 40                   | 4937     | 34 4     | 1                      |
| 0 44                 | 0 09878  | +40 5    | - 1                    | 2 44 | 0 12190  | - 3 6    | - 2                    | 4 44 | 0 04574  | -31 6    | + 1                    | 6 44                 | 0 05 76  | +35 5    | + 1                    |
| 48                   | 1 039    | 40 0     | 1                      | 48   | 1 093    | 5 1      |                        | 48   | 4449     | 30 8     |                        | 48                   | 5 1      | 36 5     | 1                      |
| 52                   | 10198    | 39 3     | 1                      | 52   | 11989    | 6 5      |                        | 52   | 4328     | 29 6     |                        | 52                   | 5368     | 37 1     | 1                      |
| 56                   | 1 353    | 38 5     | 1                      | 56   | 11881    | 27 5     |                        | 56   | 4 12     | 28 4     | 1                      | 56                   | 5518     | 37 8     | 1                      |
| 60                   | 105 6    | 37 9     | 1                      | 60   | 11769    | 28 5     | 1                      | 60   | 4101     | 27 3     |                        | 60                   | 5670     | 38 6     | 1                      |
| 0 64                 | 0 10656  | +37 0    | - 1                    | 2 64 | 0 11653  | -29 8    | - 2                    | 4 64 | 0 03994  | -26 1    | + 2                    | 6 64                 | 0 05827  | +39 4    | + 1                    |
| 68                   | 10802    | 36 1     | 1                      | 68   | 11531    | 30 9     | 1                      | 68   | 3892     | 24 8     |                        | 68                   | 5985     | 40 0     | 1                      |
| 72                   | 10945    | 35 3     | 1                      | 72   | 11406    | 31 9     | 1                      | 72   | 3796     | 23 5     | 2                      | 72                   | 6147     | 40 6     | 1                      |
| 76                   | 11084    | 34 4     | 1                      | 76   | 11276    | 33 0     | 1                      | 76   | 3704     | 22 1     | 2                      | 76                   | 6310     | 41 1     | 1                      |
| 80                   | 1122     | 33 5     | 1                      | 80   | 1114     | 33 9     | 1                      | 80   | 3619     | 20 8     | 2                      | 80                   | 6476     | 41 8     | + 1                    |
| 0 84                 | 0 1135   | +3 4     | - 1                    | 2 84 | 0 11005  | -35 0    | - 1                    | 4 84 | 0 03538  | -19 5    | +                      | 6 84                 | 0 06644  | +42 5    | 0                      |
| 88                   | 11479    | 31 3     | 1                      | 88   | 10862    | 35 9     | 1                      | 88   | 3463     | 18 1     |                        | 88                   | 6815     | 42 8     | 0                      |
| 92                   | 1160     | 30 3     | 1                      | 92   | 10718    | 36 5     | 1                      | 92   | 3393     | 16 8     | 2                      | 92                   | 6986     | 4 8      | 0                      |
| 96                   | 11721    | 9 3      | 1                      | 96   | 10570    | 37 4     | 1                      | 96   | 3329     | 15 3     | 2                      | 96                   | 7157     | 43 0     | 0                      |
| 1 00                 | 11836    | 28 0     |                        | 3 00 | 10419    | 38 3     | 1                      | 5 00 | 3 71     | 13 8     | 2                      | 7 00                 | 7330     | 43 3     | 0                      |
| 1 04                 | 0 11945  | +26 6    | - 2                    | 3 04 | 0 1 64   | -39 0    | - 1                    | 5 04 | 0 03 19  | -12 3    | +                      | 7 04                 | 0 07503  | +43 5    | 0                      |
| 08                   | 12 49    | 25 5     | 2                      | 08   | 10107    | 39 6     | 1                      | 08   | 3173     | 10 9     | 2                      | 08                   | 7678     | 43 8     | 0                      |
| 12                   | 1 149    | 4 3      |                        | 12   | 9947     | 40 3     | 1                      | 12   | 313      | 9 5      | 2                      | 12                   | 7853     | 43 8     | 0                      |
| 16                   | 1 243    | 2 9      |                        | 16   | 9785     | 40 9     | 1                      | 16   | 3097     | 7 9      | 2                      | 16                   | 80 8     | 43 8     | 0                      |
| 20                   | 1233     | 21 6     |                        | 20   | 9620     | 41 5     | 1                      | 20   | 3069     | 6 3      | 2                      | 20                   | 8 03     | 43 8     | 0                      |
| 1 24                 | 0 1 416  | + 0 4    | -                      | 3 24 | 0 09453  | -41 9    | - 1                    | 5 24 | 0 03047  | - 4 8    | + 2                    | 7 24                 | 0 08378  | +43 8    | 0                      |
| 28                   | 1 495    | 19 0     |                        | 28   | 9 85     | 42 3     | 1                      | 28   | 3031     | 3 3      | 2                      | 28                   | 8553     | 43 5     | 0                      |
| 32                   | 1 568    | 17 5     |                        | 32   | 9115     | 42 6     | 1                      | 32   | 3021     | 1 6      |                        | 32                   | 8726     | 43 3     | 0                      |
| 36                   | 12635    | 16       |                        | 36   | 8944     | 43 0     | - 1                    | 36   | 3018     | - 0 1    | 2                      | 36                   | 8899     | 43 0     | 0                      |
| 40                   | 1 696    | 14 5     |                        | 40   | 8771     | 43 3     | 0                      | 40   | 30 0     | + 1 3    | 2                      | 40                   | 9070     | 42 8     | 0                      |
| 1 44                 | 1 751    | +13 1    | -                      | 3 44 | 0 08598  | -43 4    | 0                      | 5 44 | 0 030 8  | + 2 8    | + 2                    | 7 44                 | 0 09241  | +42 5    | 0                      |
| 48                   | 1 8 1    | 11 8     |                        | 48   | 8424     | 43 6     | 0                      | 48   | 304      | 4 4      | 2                      | 48                   | 9410     | 4        | - 1                    |
| 52                   | 1 845    | 10 3     | 2                      | 52   | 8249     | 43 8     | 0                      | 52   | 3 63     | 6        |                        | 52                   | 9577     | 41 4     | 1                      |
| 56                   | 1 883    | 8 8      |                        | 56   | 8074     | 43 8     | 0                      | 56   | 3090     | 7 5      | 2                      | 56                   | 9741     | 40 9     | 1                      |
| 60                   | 1 915    | 7 3      | 2                      | 60   | 7899     | 43 8     | 0                      | 60   | 3123     | 8 9      | 2                      | 60                   | 9904     | 40 4     | 1                      |
| 1 64                 | 0 1 941  | + 5 6    |                        | 3 64 | 0 07724  | -43 8    | 0                      | 5 64 | 0 03161  | +10 4    | +                      | 7 64                 | 0 10064  | +39 8    | - 1                    |
| 68                   | 1 960    | 4 1      |                        | 68   | 7549     | 43 6     | 0                      | 68   | 3206     | 12 0     | 2                      | 68                   | 10222    | 39 1     | 1                      |
| 72                   | 1 974    | 2 6      |                        | 72   | 7375     | 43 4     | 0                      | 72   | 3 57     | 13 4     |                        | 72                   | 10377    | 38 4     | 1                      |
| 76                   | 1 981    | + 1 1    | 2                      | 76   | 7 0      | 43 3     | 0                      | 76   | 3313     | 14 9     |                        | 76                   | 10529    | 37 8     | 1                      |
| 80                   | 12983    | - 0 4    | 2                      | 80   | 70 9     | 43 0     | + 1                    | 80   | 3376     | 16 5     | 2                      | 80                   | 10679    | 37 0     | 1                      |
| 1 84                 | 0 12978  | - 0      | -                      | 3 84 | 0 06858  | -4 6     | + 1                    | 5 84 | 0 03445  | +17 8    | + 2                    | 7 84                 | 0 10825  | +36 0    | - 1                    |
| 88                   | 1 967    | 3 5      |                        | 88   | 6688     | 4 3      | 1                      | 88   | 3518     | 19 1     | 2                      | 88                   | 10967    | 35 3     | 1                      |
| 92                   | 1 950    | 5 0      | 2                      | 92   | 6520     | 41 8     | 1                      | 92   | 3598     | 20 5     |                        | 92                   | 11107    | 34 5     | 1                      |
| 96                   | 1 9 7    | 6 6      | 2                      | 96   | 6354     | 41 3     | 1                      | 96   | 368      | 1 9      |                        | 96                   | 11243    | 33 3     | 2                      |
| 2 00                 | 0 1 897  | - 8 1    | - 2                    | 4 00 | 0 619    | -40 8    | + 1                    | 6 00 | 0 03773  | +23 3    | +                      | 8 00                 | 0 11373  | +32 0    | - 2                    |

Applied to t + 8

# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Latitude

XXXIX

XL

| 1    | 2        | 3                      | 1    | 2        | 3                      |
|------|----------|------------------------|------|----------|------------------------|
| T    | Equation | $\Delta_{0d \cdot 01}$ | T    | Equation | $\Delta_{0d \cdot 01}$ |
| d    |          |                        | d    |          |                        |
| 0'00 | 0'00900  | -3,9                   | 4'00 | 0'01063  | +3,7                   |
| 08   | 869      | 3,9                    | 08   | 1092     | 3,6                    |
| 16   | 837      | 3,9                    | 16   | 1120     | 3,4                    |
| 24   | 806      | 3,8                    | 24   | 1147     | 3,3                    |
| 32   | 776      | 3,8                    | 32   | 1172     | 3,1                    |
| 40   | 746      | 3,7                    | 40   | 1196     | 2,9                    |
| 0'48 | 0'00717  | -3,6                   | 4'48 | 0'01219  | +2,8                   |
| 56   | 689      | 3,4                    | 56   | 1240     | 2,6                    |
| 64   | 662      | 3,3                    | 64   | 1260     | 2,4                    |
| 72   | 636      | 3,2                    | 72   | 1278     | 2,1                    |
| 80   | 611      | 3,0                    | 80   | 1294     | 1,8                    |
| 0'88 | 0'00588  | -2,8                   | 4'88 | 0'01307  | +1,6                   |
| 96   | 566      | 2,6                    | 96   | 1319     | 1,4                    |
| 1'04 | 546      | 2,4                    | 5'04 | 1329     | 1,1                    |
| 12   | 528      | 2,2                    | 12   | 1337     | 0,8                    |
| 20   | 511      | 1,9                    | 20   | 1342     | 0,6                    |
| 1'28 | 0'00497  | -1,7                   | 5'28 | 0'01346  | +0,3                   |
| 36   | 484      | 1,4                    | 36   | 1347     | 0,0                    |
| 44   | 474      | 1,2                    | 44   | 1346     | -0,3                   |
| 52   | 465      | 0,9                    | 52   | 1343     | 0,6                    |
| 60   | 459      | 0,6                    | 60   | 1337     | 0,8                    |
| 1'68 | 0'00455  | -0,4                   | 5'68 | 0'01330  | -1,1                   |
| 76   | 453      | -0,1                   | 76   | 1320     | 1,4                    |
| 84   | 454      | +0,2                   | 84   | 1308     | 1,6                    |
| 92   | 456      | 0,4                    | 92   | 1294     | 1,8                    |
| 2'00 | 461      | 0,7                    | 6'00 | 1279     | 2,1                    |
| 2'08 | 0'00468  | +1,0                   | 6'08 | 0'01261  | -2,3                   |
| 16   | 477      | 1,3                    | 16   | 1242     | 2,5                    |
| 24   | 488      | 1,5                    | 24   | 1221     | 2,8                    |
| 32   | 501      | 1,8                    | 32   | 1198     | 2,9                    |
| 40   | 516      | 2,0                    | 40   | 1174     | 3,1                    |
| 2'48 | 0'00533  | +2,3                   | 6'48 | 0'01148  | -3,3                   |
| 56   | 552      | 2,5                    | 56   | 1121     | 3,4                    |
| 64   | 573      | 2,7                    | 64   | 1094     | 3,5                    |
| 72   | 595      | 2,9                    | 72   | 1065     | 3,7                    |
| 80   | 619      | 3,1                    | 80   | 1035     | 3,8                    |
| 2'88 | 0'00644  | +3,2                   | 6'88 | 0'01005  | -3,8                   |
| 96   | 670      | 3,4                    | 96   | 974      | 3,9                    |
| 3'04 | 698      | 3,5                    | 7'04 | 943      | 3,9                    |
| 12   | 726      | 3,6                    | 12   | 912      | 3,9                    |
| 20   | 755      | 3,7                    | 20   | 880      | 3,9                    |
| 3'28 | 0'00785  | +3,8                   | 7'28 | 0'00849  | -3,9                   |
| 36   | 816      | 3,9                    | 36   | 818      | 3,9                    |
| 44   | 847      | 3,9                    | 44   | 787      | 3,8                    |
| 52   | 878      | 3,9                    | 52   | 757      | 3,7                    |
| 60   | 910      | 3,9                    | 60   | 728      | 3,6                    |
| 3'68 | 0'00941  | +3,9                   | 7'68 | 0'00699  | -3,5                   |
| 76   | 972      | 3,9                    | 76   | 672      | 3,4                    |
| 84   | 1003     | 3,8                    | 84   | 645      | 3,3                    |
| 92   | 1033     | 3,8                    | 92   | 620      | 3,1                    |
| 4'00 | 0'01063  | +3,7                   | 8'00 | 0'00596  | -2,9                   |

Applied Constant: +0'00900.

| 1    | 2        | 3                      | 1    | 2        | 3                      | 1    | 2        | 3                      |
|------|----------|------------------------|------|----------|------------------------|------|----------|------------------------|
| U    | Equation | $\Delta_{0d \cdot 01}$ | U    | Equation | $\Delta_{0d \cdot 01}$ | U    | Equation | $\Delta_{0d \cdot 00}$ |
| d    |          |                        | d    |          |                        | d    |          |                        |
| 0'00 | 0'01000  | +8,6                   | 2'50 | 0'01790  | -5,0                   | 5'00 | 0'00076  | -2,7                   |
| 05   | 1043     | 8,5                    | 55   | 1764     | 5,3                    | 05   | 63       | 2,4                    |
| 10   | 1085     | 8,5                    | 60   | 1737     | 5,6                    | 10   | 52       | 1,9                    |
| 15   | 1128     | 8,5                    | 65   | 1708     | 5,9                    | 15   | 44       | 1,6                    |
| 20   | 1170     | 8,4                    | 70   | 1678     | 6,1                    | 20   | 36       | 1,3                    |
| 25   | 1212     | 8,4                    | 75   | 1647     | 6,4                    | 25   | 31       | 0,8                    |
| 0'30 | 0'01254  | +8,3                   | 2'80 | 0'01614  | -6,7                   | 5'30 | 0'00028  | -0,5                   |
| 35   | 1295     | 8,1                    | 85   | 1580     | 6,8                    | 35   | 26       | -0,2                   |
| 40   | 1335     | 8,0                    | 90   | 1546     | 7,1                    | 40   | 26       | +0,3                   |
| 45   | 1375     | 8,0                    | 95   | 1509     | 7,3                    | 45   | 29       | 0,7                    |
| 50   | 1415     | 7,8                    | 3'00 | 1473     | 7,4                    | 50   | 33       | 1,0                    |
| 0'55 | 0'01453  | +7,5                   | 3'05 | 0'01435  | -7,7                   | 5'55 | 0'00039  | +1,4                   |
| 60   | 1490     | 7,3                    | 10   | 1396     | 7,8                    | 60   | 47       | 1,7                    |
| 65   | 1526     | 7,2                    | 15   | 1357     | 7,9                    | 65   | 56       | 2,1                    |
| 70   | 1562     | 7,0                    | 20   | 1317     | 8,1                    | 70   | 68       | 2,5                    |
| 75   | 1596     | 6,7                    | 25   | 1276     | 8,2                    | 75   | 81       | 2,8                    |
| 0'80 | 0'01629  | +6,5                   | 3'30 | 0'01235  | -8,3                   | 5'80 | 0'00096  | +3,2                   |
| 85   | 1661     | 6,3                    | 35   | 1193     | 8,4                    | 85   | 113      | 3,6                    |
| 90   | 1692     | 6,0                    | 40   | 1151     | 8,4                    | 90   | 132      | 3,9                    |
| 95   | 1721     | 5,8                    | 45   | 1109     | 8,5                    | 95   | 152      | 4,1                    |
| 1'00 | 1750     | 5,5                    | 50   | 1066     | 8,6                    | 6'00 | 173      | 4,5                    |
| 1'05 | 0'01776  | +5,1                   | 3'55 | 0'01023  | -8,6                   | 6'05 | 0'00197  | +4,8                   |
| 10   | 1801     | 4,8                    | 60   | 980      | 8,6                    | 10   | 221      | 5,1                    |
| 15   | 1824     | 4,6                    | 65   | 937      | 8,5                    | 15   | 248      | 5,5                    |
| 20   | 1847     | 4,3                    | 70   | 895      | 8,5                    | 20   | 276      | 5,7                    |
| 25   | 1867     | 3,9                    | 75   | 852      | 8,4                    | 25   | 305      | 6,0                    |
| 1'30 | 0'01886  | +3,6                   | 3'80 | 0'00811  | -8,3                   | 6'30 | 0'00336  | +6,3                   |
| 35   | 1903     | 3,2                    | 85   | 769      | 8,3                    | 35   | 368      | 6,5                    |
| 40   | 1918     | 2,8                    | 90   | 728      | 8,2                    | 40   | 401      | 6,7                    |
| 45   | 1931     | 2,4                    | 95   | 687      | 8,1                    | 45   | 435      | 6,9                    |
| 50   | 1942     | 2,1                    | 4'00 | 647      | 8,0                    | 50   | 470      | 7,2                    |
| 1'55 | 0'01952  | +1,8                   | 4'05 | 0'00607  | -7,9                   | 6'55 | 0'00507  | +7,4                   |
| 60   | 1960     | 1,5                    | 10   | 568      | 7,7                    | 60   | 544      | 7,6                    |
| 65   | 1967     | 1,1                    | 15   | 530      | 7,5                    | 65   | 583      | 7,8                    |
| 70   | 1971     | 0,7                    | 20   | 493      | 7,3                    | 70   | 622      | 7,8                    |
| 75   | 1974     | +0,3                   | 25   | 457      | 7,1                    | 75   | 661      | 8,0                    |
| 1'80 | 0'01974  | -0,1                   | 4'30 | 0'00422  | -6,8                   | 6'80 | 0'00702  | +8,2                   |
| 85   | 1973     | 0,5                    | 35   | 389      | 6,6                    | 85   | 743      | 8,3                    |
| 90   | 1969     | 0,8                    | 40   | 356      | 6,4                    | 90   | 785      | 8,4                    |
| 95   | 1964     | 1,2                    | 45   | 325      | 6,2                    | 95   | 827      | 8,3                    |
| 2'00 | 1957     | 1,6                    | 50   | 294      | 5,9                    | 7'00 | 868      | 8,4                    |
| 2'05 | 0'01948  | -1,9                   | 4'55 | 0'00266  | -5,6                   | 7'05 | 0'00911  | +8,5                   |
| 10   | 1938     | 2,3                    | 60   | 238      | 5,4                    | 10   | 953      | 8,5                    |
| 15   | 1925     | 2,7                    | 65   | 212      | 5,1                    | 15   | 996      | 8,6                    |
| 20   | 1911     | 3,0                    | 70   | 187      | 4,7                    | 20   | 1039     | 8,6                    |
| 25   | 1895     | 3,3                    | 75   | 165      | 4,3                    | 25   | 1082     | 8,5                    |
| 2'30 | 0'01878  | -3,7                   | 4'80 | 0'00144  | -4,1                   | 7'30 | 0'01124  | +8,4                   |
| 35   | 1858     | 4,1                    | 85   | 124      | 3,8                    | 35   | 1166     | 8,5                    |
| 40   | 1837     | 4,4                    | 90   | 106      | 3,4                    | 40   | 1209     | 8,4                    |
| 45   | 1814     | 4,7                    | 95   | 90       | 3,0                    | 45   | 1250     | 8,3                    |
| 2'50 | 0'01790  | -5,0                   | 5'00 | 0'00076  | -2,7                   | 7'50 | 0'01292  | +8,2                   |

Applied Constant: +0'00000.



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

XLI

Equations of Latitude

Argument V

| V  | Equation | V  | Equation | V  | Equation | V  | Equation |
|----|----------|----|----------|----|----------|----|----------|
| 00 | 0 00080  | 20 | 0 0130   | 40 | 0 0006   | 60 | 0 00036  |
| 1  | 85       | 1  | 1 9      | 1  | 58       | 1  | 39       |
| 2  | 89       | 2  | 128      | 2  | 54       | 2  | 41       |
| 3  | 93       | 3  | 126      | 3  | 51       | 3  | 44       |
| 4  | 98       | 4  | 124      | 4  | 47       | 4  | 48       |
| 5  | 1        | 5  | 122      | 5  | 43       | 5  | 52       |
| 06 | 0 00106  | 26 | 0 00119  | 46 | 0 00 40  | 66 | 0 00056  |
| 7  | 109      | 7  | 116      | 7  | 38       | 7  | 59       |
| 8  | 113      | 8  | 112      | 8  | 36       | 8  | 63       |
| 9  | 116      | 9  | 109      | 9  | 33       | 9  | 68       |
| 10 | 119      | 30 | 106      | 50 | 31       | 70 | 72       |
| 11 | 0 00121  | 31 | 0 001 1  | 51 | 0 00030  | 71 | 0 00076  |
| 2  | 1 4      | 2  | 97       | 2  | 30       | 2  | 81       |
| 3  | 126      | 3  | 93       | 3  | 29       | 3  | 86       |
| 4  | 1 8      | 4  | 88       | 4  | 9        | 4  | 90       |
| 5  | 13       | 5  | 84       | 5  | 29       | 5  | 94       |
| 16 | 0 00130  | 36 | 0 00080  | 56 | 0 00030  | 76 | 0 00098  |
| 7  | 131      | 7  | 75       | 7  | 31       | 7  | 103      |
| 8  | 131      | 8  | 70       | 8  | 32       | 8  | 107      |
| 9  | 131      | 9  | 66       | 9  | 34       | 9  | 110      |
| 20 | 0 00130  | 40 | 0 0062   | 60 | 0 00036  | 80 | 0 00114  |

Appl dC t t + 8

XLII

Arguments O,  $\alpha$

| <div><div>O</div><div>a</div></div> | 0 <sup>d</sup> 0 <sup>d</sup> 4 <sup>d</sup> 0 <sup>d</sup> 8 |    |    | 1 <sup>d</sup> 2 <sup>d</sup> 1 <sup>d</sup> 6 <sup>d</sup> 2 <sup>d</sup> 0 |    |    | 2 <sup>d</sup> 4 <sup>d</sup> 2 <sup>d</sup> 8 <sup>d</sup> 3 <sup>d</sup> 2 |    |    | 3 <sup>d</sup> 6 <sup>d</sup> 4 <sup>d</sup> 0 <sup>d</sup> 4 <sup>d</sup> 4 |    |    | 4 <sup>d</sup> 8 <sup>d</sup> 5 <sup>d</sup> 2 <sup>d</sup> 5 <sup>d</sup> 6 |    |    | 6 <sup>d</sup> 0 <sup>d</sup> 6 <sup>d</sup> 4 <sup>d</sup> 6 <sup>d</sup> 8 |    |    | 7 <sup>d</sup> 2 <sup>d</sup> 7 <sup>d</sup> 6 <sup>d</sup> 8 <sup>d</sup> 0 |    |    |
|-------------------------------------|---|----|----|--|----|----|--|----|----|--|----|----|--|----|----|--|----|----|--|----|----|
| 0                                   | 2   | 20 | 21 | 1  | 1  | 21 | 21   | 1  | 0  | 20   | 20 | 19 | 19   | 19 | 19 | 19   | 19 | 20 | 0  | 20 | 0  |
| 200                                 | 5   | 4  | 3  | 3  | 22 | 20 | 19   | 17 | 16 | 15   | 16 | 17 | 17   | 18 | 0  | 21   | 23 | 24 | 25   | 24 | 23 |
| 400                                 | 29  | 28 | 27 | 4  | 3  | 19 | 16   | 13 | 1  | 11   | 1  | 14 | 16   | 18 | 1  | 24   | 27 | 28 | 29   | 28 | 27 |
| 600                                 | 3   | 31 | 9  | 6  | 3  | 19 | 14   | 11 | 9  | 8  | 9  | 11 | 14   | 18 | 1  | 6  | 9  | 31 | 32   | 31 | 9  |
| 800                                 | 35  | 34 | 31 | 7  | 3  | 17 | 13   | 9  | 6  | 5  | 6  | 9  | 13   | 18 | 23 | 7  | 31 | 34 | 35   | 34 | 31 |
| 1000                                | 36  | 35 | 32 | 28   | 3  | 17 | 12   | 8  | 5  | 4  | 5  | 8  | 12   | 18 | 3  | 28   | 3  | 35 | 36   | 35 | 32 |
| 1200                                | 36  | 35 | 3  | 28   | 3  | 17 | 12   | 8  | 5  | 4  | 5  | 8  | 12   | 18 | 3  | 28   | 32 | 35 | 36   | 35 | 32 |
| 1400                                | 34  | 33 | 31 | 27   | 2  | 17 | 13   | 9  | 7  | 6  | 7  | 9  | 13   | 18 | 3  | 27   | 31 | 33 | 34   | 33 | 31 |
| 1600                                | 3   | 31 | 29 | 26   | 1  | 17 | 14   | 11 | 9  | 8  | 9  | 11 | 14   | 19 | 23 | 26   | 29 | 31 | 32   | 31 | 29 |
| 1800                                | 8   | 8  | 26 | 4  | 21 | 17 | 16   | 14 | 1  | 1  | 1  | 14 | 16   | 0  | 3  | 4  | 6  | 28 | 28   | 28 | 26 |
| 2000                                | 4   | 24 | 3  | 21   | 20 | 18 | 17   | 17 | 16 | 16   | 16 | 17 | 19   | 21 | 2  | 23   | 3  | 24 | 24   | 4  | 23 |
| 2200                                | 19  | 19 | 19 | 19   | 19 | 19 | 19   | 0  | 1  | 21   | 1  |    | 1  | 21 | 21 | 1  | 20 | 19 | 19   | 19 | 19 |
| 2400                                | 15  | 15 | 16 | 16   | 18 | 20 | 22   | 4  | 25 | 5  | 5  | 4  | 24   | 22 | 20 | 18   | 16 | 15 | 15   | 15 | 16 |
| 2600                                | 11  | 11 | 13 | 15   | 17 | 21 | 25   | 27 | 29 | 29   | 9  | 7  | 5  | 22 | 19 | 15   | 13 | 11 | 11   | 11 | 13 |
| 2800                                | 7   | 8  | 10 | 14   | 17 | 1  | 26   | 30 | 32 | 33   | 3  | 30 | 6  | 23 | 19 | 14   | 10 | 8  | 7  | 8  | 10 |
| 3000                                | 5   | 6  | 9  | 13   | 17 | 23 | 7  | 31 | 34 | 35   | 34 | 31 | 7  | 2  | 17 | 13   | 9  | 6  | 5  | 6  | 9  |
| 3200                                | 4   | 5  | 8  | 1  | 17 | 3  | 28   | 32 | 35 | 36   | 35 | 3  | 28   | 2  | 17 | 1  | 8  | 5  | 4  | 5  | 8  |
| 3400                                | 4   | 5  | 8  | 1  | 17 | 3  | 8  | 3  | 35 | 36   | 35 | 3  | 8  |    | 17 | 12   | 8  | 5  | 4  | 5  | 8  |
| 3600                                | 6   | 7  | 10 | 13   | 18 | 3  | 27   | 30 | 33 | 34   | 33 | 30 | 27   | 22 | 17 | 13   | 10 | 7  | 6  | 7  | 10 |
| 3800                                | 9   | 10 | 1  | 14   | 19 | 23 | 26   | 8  | 30 | 31   | 30 | 8  | 6  | 1  | 17 | 14   | 12 | 10 | 9  | 1  | 12 |
| 4000                                | 13  | 13 | 14 | 16   | 0  |    | 24   | 6  | 7  | 7  | 27 | 26 | 24   | 20 | 18 | 16   | 14 | 13 | 13   | 13 | 14 |
| 4200                                | 17  | 17 | 18 | 19   | 0  | 21 | 3  |    | 3  | 3  | 3  |    | 1  | 19 | 18 | 17   | 18 | 17 | 17   | 17 | 18 |
| 4400                                | 2   | 21 |    |  | 1  | 21 |  | 0  | 19 | 18   | 19 | 18 | 18   | 19 | 19 | 0  | 20 | 21 | 22   | 21 | 21 |
| 4600                                | 26  | 26 | 5  | 24   |    | 0  | 18   | 15 | 14 | 14   | 14 | 15 | 16   | 18 | 20 |  | 25 | 6  | 26   | 6  | 25 |
| 4800                                | 30  | 9  | 8  | 5  | 3  | 19 | 15   | 12 | 11 | 10   | 11 | 1  | 15   | 18 | 1  | 5  | 8  | 29 | 30   | 29 | 28 |
| 5000                                | 33  | 3  | 30 | 27   | 23 | 19 | 13   | 10 | 8  |  | 8  | 10 | 13   | 17 | 1  | 27   | 30 | 3  | 33   | 3  | 30 |

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Th t q l



# SATELLITE III

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Latitude

#### XLIII

#### Occultations and Transits

To correct for the Jovicentric Latitude of the Earth, the Satellite's Latitude as derived from Tables XXXVII-XLII, must be supplemented by the term—

$$\pm .365938 R_1 \sin (\odot - \Omega) / \Delta \quad \begin{cases} +\text{Oc.} \\ -\text{Tr.} \end{cases}$$

(9.563408)

where  $R_1$ ,  $\Delta$  are the Geocentric Distances of the Sun and Jupiter respectively, and  $\Omega$  the Longitude of the Ascending Node of Jupiter's Orbit on the Ecliptic. For Occultations employ the natural sign, for Transits the reversed sign.

#### XLIV

#### Correction of Latitude for Shadows and Transits

| 1    | 2                            | 3                | 4    |
|------|------------------------------|------------------|------|
| Lat. | Corr <sup>n</sup> . Sh., Tr. | $\Delta$<br>0.01 | Lat. |
| 0.00 | - .00275 +                   | 2,8              | 2.00 |
| .05  | 262                          | 2,8              | 1.95 |
| .10  | 248                          | 2,8              | .90  |
| .15  | 234                          | 2,8              | .85  |
| .20  | 220                          | 2,8              | .80  |
| .25  | 207                          | 2,8              | .75  |
| 0.30 | - .00193 +                   | 2,8              | 1.70 |
| .35  | 179                          | 2,8              | .65  |
| .40  | 165                          | 2,8              | .60  |
| .45  | 152                          | 2,8              | .55  |
| .50  | 138                          | 2,8              | .50  |
| 0.55 | - .00124 +                   | 2,8              | 1.45 |
| .60  | 110                          | 2,8              | .40  |
| .65  | 97                           | 2,8              | .35  |
| .70  | 83                           | 2,8              | .30  |
| .75  | 69                           | 2,8              | .25  |
| 0.80 | - .00055 +                   | 2,8              | 1.20 |
| .85  | 42                           | 2,8              | .15  |
| .90  | 28                           | 2,8              | .10  |
| .95  | - 14 +                       | 2,8              | .05  |
| 1.00 | .00000                       | 2,8              | 1.00 |

This Correction to be applied to Latitude as found from Tables XXXVII-XLIII, before using as Argument of the Semi-duration for Shadows and Transits.

#### XLV

#### Angle above Jupiter's Orbit

| 1    | 2          | 3                | 4    |
|------|------------|------------------|------|
| Lat. | Angle      | $\Delta$<br>0.01 | Lat. |
| 0.00 | - 3.5743 + | 356,5            | 2.00 |
| .05  | 3.3960     | 356,7            | 1.95 |
| .10  | 3.2177     | 356,7            | .90  |
| .15  | 3.0393     | 356,9            | .85  |
| .20  | 2.8608     | 357,0            | .80  |
| .25  | 2.6823     | 357,1            | .75  |
| 0.30 | - 2.5037 + | 357,2            | 1.70 |
| .35  | 2.3251     | 357,3            | .65  |
| .40  | 2.1464     | 357,4            | .60  |
| .45  | 1.9677     | 357,5            | .55  |
| .50  | 1.7889     | 357,6            | .50  |
| 0.55 | - 1.6101 + | 357,6            | 1.45 |
| .60  | 1.4313     | 357,6            | .40  |
| .65  | 1.2525     | 357,7            | .35  |
| .70  | 1.0736     | 357,8            | .30  |
| .75  | 0.8947     | 357,9            | .25  |
| 0.80 | - 0.7157 + | 357,9            | 1.20 |
| .85  | 0.5368     | 357,8            | .15  |
| .90  | 0.3579     | 357,9            | .10  |
| .95  | - 0.1790 + | 357,9            | .05  |
| 1.00 | 0.0000     | 358,0            | 1.00 |

This Table shows the Angle of the Satellite above Jupiter's Orbit, which corresponds to the Latitude as found for Tables XXXVII-XLII.

# SATELLITE III

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## Tables

of the

Synodic Motion,

Duration of the Phenomena of Eclipse,  
Occultation, Transit and Shadow-Transit,

with

Equations for Reduction to the Middle,  
Corrections for Jupiter's Phase,

and

Light-Curve of Eclipse

# SATELLITE III

## Tables of Synodic Motion

### XLVI

| 1                 | 2            | 1                 | 2            | 1                 | 2            | 1                 | 2            | 1                 | 2            |
|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|-------------------|--------------|
| Angle             | Syn. Value   | Angle             | Syn. Value   | Angle             | Syn. Value   | Angle             | Syn. Value   | Angle             | Syn. Value   |
| °<br><b>0'000</b> | d<br>'000000 | °<br><b>0'020</b> | d<br>'000398 | °<br><b>0'040</b> | d<br>'000796 | °<br><b>0'060</b> | d<br>'001194 | °<br><b>0'080</b> | d<br>'001593 |
| <b>1</b>          | 20           | <b>21</b>         | 418          | <b>41</b>         | 816          | <b>61</b>         | 1214         | <b>81</b>         | 1612         |
| <b>2</b>          | 40           | <b>22</b>         | 438          | <b>42</b>         | 836          | <b>62</b>         | 1234         | <b>82</b>         | 1632         |
| <b>3</b>          | 60           | <b>23</b>         | 458          | <b>43</b>         | 856          | <b>63</b>         | 1254         | <b>83</b>         | 1652         |
| <b>4</b>          | 80           | <b>24</b>         | 478          | <b>44</b>         | 876          | <b>64</b>         | 1274         | <b>84</b>         | 1672         |
| <b>5</b>          | 100          | <b>25</b>         | 498          | <b>45</b>         | 896          | <b>65</b>         | 1294         | <b>85</b>         | 1692         |
| <b>0'006</b>      | '000119      | <b>0'026</b>      | '000518      | <b>0'046</b>      | '000916      | <b>0'066</b>      | '001314      | <b>0'086</b>      | '001712      |
| <b>7</b>          | 139          | <b>27</b>         | 537          | <b>47</b>         | 936          | <b>67</b>         | 1334         | <b>87</b>         | 1732         |
| <b>8</b>          | 159          | <b>28</b>         | 557          | <b>48</b>         | 956          | <b>68</b>         | 1354         | <b>88</b>         | 1752         |
| <b>9</b>          | 179          | <b>29</b>         | 577          | <b>49</b>         | 975          | <b>69</b>         | 1374         | <b>89</b>         | 1772         |
| <b>10</b>         | 199          | <b>30</b>         | 597          | <b>50</b>         | 995          | <b>70</b>         | 1393         | <b>90</b>         | 1792         |
| <b>0'011</b>      | '000219      | <b>0'031</b>      | '000617      | <b>0'051</b>      | '001015      | <b>0'071</b>      | '001413      | <b>0'091</b>      | '001812      |
| <b>12</b>         | 239          | <b>32</b>         | 637          | <b>52</b>         | 1035         | <b>72</b>         | 1433         | <b>92</b>         | 1831         |
| <b>13</b>         | 259          | <b>33</b>         | 657          | <b>53</b>         | 1055         | <b>73</b>         | 1453         | <b>93</b>         | 1851         |
| <b>14</b>         | 279          | <b>34</b>         | 677          | <b>54</b>         | 1075         | <b>74</b>         | 1473         | <b>94</b>         | 1871         |
| <b>15</b>         | 299          | <b>35</b>         | 697          | <b>55</b>         | 1095         | <b>75</b>         | 1493         | <b>95</b>         | 1891         |
| <b>0'016</b>      | '000319      | <b>0'036</b>      | '000717      | <b>0'056</b>      | '001115      | <b>0'076</b>      | '001513      | <b>0'096</b>      | '001911      |
| <b>17</b>         | 338          | <b>37</b>         | 737          | <b>57</b>         | 1135         | <b>77</b>         | 1533         | <b>97</b>         | 1931         |
| <b>18</b>         | 358          | <b>38</b>         | 756          | <b>58</b>         | 1155         | <b>78</b>         | 1553         | <b>98</b>         | 1951         |
| <b>19</b>         | 378          | <b>39</b>         | 776          | <b>59</b>         | 1174         | <b>79</b>         | 1573         | <b>99</b>         | 1971         |
| <b>0'020</b>      | '000398      | <b>0'040</b>      | '000796      | <b>0'060</b>      | '001194      | <b>0'080</b>      | '001593      | <b>0'100</b>      | '001991      |

### XLVII

| 1               | 2            |
|-----------------|--------------|
| Angle           | Syn. Value   |
| °<br><b>0'0</b> | d<br>'000000 |
| <b>1</b>        | 1991         |
| <b>2</b>        | 3981         |
| <b>3</b>        | 5972         |
| <b>4</b>        | 7963         |
| <b>5</b>        | 9953         |
| <b>0'6</b>      | '011944      |
| <b>7</b>        | 13935        |
| <b>8</b>        | 15925        |
| <b>9</b>        | 17916        |
| <b>1'0</b>      | '019907      |

These Tables show the time taken to describe a given angle with the Mean Synodic Motion. They are to be used for converting into time the Complement or excess of Jupiter's longitude over that of the Satellite at an assumed approximate time of conjunction.

To allow for the *true* Synodic Motion, modify the entry of the table by adding to it its product by the Variation as taken from Tables XXXIII-XXXVI.

# SATELLITE III

## Tables of the Phenomena

XLVIII

Correction of High Latitudes for the Variation

| V<br>L t | 010 009 008    | 007 006 005    | 004 003 002   | 001 000 + 001 | + 002 + 003 + 004 | + 005 + 006 + 007 | + 008 + 009 + 010 |
|----------|----------------|----------------|---------------|---------------|-------------------|-------------------|-------------------|
| 00       | +499 +449 +399 | +349 +99 +5    | +00 +150 +10  | +5 0 -50      | -10 -15 -20       | -250 -299 -349    | -399 -449 -499    |
| 02       | +469 +42 +375  | +38 +81 +34    | +188 +141 +94 | +47 0 -47     | -94 -141 -188     | -34 -281 -328     | -375 -422 -469    |
| 04       | +438 +394 +351 | +307 +63 +19   | +175 +131 +88 | +44 0 -44     | -88 -131 -175     | -19 -263 -37      | -351 -394 -438    |
| 06       | +407 +366 +326 | +85 +44 +04    | +163 +1 +81   | +41 0 -41     | -81 -12 -163      | -04 -44 -285      | -326 -366 -407    |
| 08       | +375 +338 +300 | +63 +25 +188   | +15 +113 +75  | +38 0 -38     | -75 -113 -15      | -188 -225 -263    | -300 -338 -375    |
| 10       | +343 +39 +75   | +40 +06 +17    | +137 +13 +69  | +34 0 -34     | -69 -13 -137      | -172 -6 -40       | -275 -309 -343    |
| 12       | +311 +80 +248  | +17 +186 +155  | +14 +93 +62   | +31 0 -31     | -6 -93 -124       | -155 -186 -217    | -248 -80 -311     |
| 14       | +77 +50 +2     | +194 +166 +139 | +111 +83 +55  | +28 0 -28     | -55 -83 -111      | -139 -166 -194    | -222 -250 -277    |
| 16       | +43 +19 +195   | +170 +146 +12  | +97 +73 +49   | +24 0 -4      | -49 -73 -97       | -122 -146 -17     | -195 -219 -243    |
| 18       | +09 +188 +167  | +146 +15 +104  | +84 +63 +4    | +1 0 -1       | -42 63 -84        | -104 -125 -146    | -167 -188 -209    |
| 20       | +174 +156 +139 | +1 +104 +87    | +69 +52 +35   | +17 0 -17     | -35 -52 -69       | -87 -104 -12      | -139 -156 -174    |
| 22       | +138 +14 +110  | +96 +8 +69     | +55 +41 +7    | +14 0 -14     | -27 -41 -55       | -69 -82 -96       | -110 -14 -138     |
| 24       | +101 +90 +8    | +70 +6 +50     | +40 +30 +20   | +10 0 -10     | - -30 -40         | -50 -60 -70       | -80 -90 -101      |
| 26       | +63 +56 +50    | +44 +38 +31    | +25 +19 +13   | +6 0 -6       | -13 -19 -5        | -31 -38 -44       | -50 -56 -63       |
| 28       | +4 + +19       | +17 +14 +1     | +10 +7 +5     | +2 0 -2       | -5 -7 -10         | -1 -14 -17        | -19 -22 -24       |
| 30       | -16 -14 -13    | -11 -10 -8     | -6 -5 -3      | -2 0 +2       | +3 +5 +6          | +8 +10 +11        | +13 +14 +16       |
| 32       | -57 -51 -46    | -40 -34 -9     | -23 -17 -11   | -6 0 +6       | +11 +17 +23       | +29 +34 +40       | +46 +51 +57       |
| 34       | -99 -90 -80    | -70 -6 -5      | -40 -30 -20   | -10 0 +10     | +0 +30 +40        | +50 +60 +70       | +80 +90 +99       |
| 36       | -143 -19 -115  | -100 -86 -7    | -57 -43 -9    | -14 0 +14     | +29 +43 +57       | +72 +86 +100      | +115 +129 +143    |
| 38       | -189 -170 -151 | -13 -113 -94   | -75 -57 -38   | -19 0 +19     | +38 +57 +75       | +94 +113 +132     | +151 +170 +189    |
| 40       | -36 -21 -188   | -165 -141 -118 | -94 -71 -47   | -24 0 +24     | +47 +71 +94       | +118 +141 +165    | +188 +212 +36     |
| 42       | -85 -256 -228  | -199 -171 -14  | -114 -85 -57  | -8 0 +28      | +57 +85 +114      | +142 +171 +199    | +228 +256 +285    |
| 44       | -335 -30 -268  | -35 -01 -168   | -134 -101 -67 | -34 0 +34     | +67 +101 +134     | +168 +21 +235     | +268 +30 +335     |
| 46       | -388 -350 -311 | -7 -33 -194    | -155 -117 -78 | -39 0 +39     | +78 +117 +155     | +194 +233 +72     | +311 +350 +388    |
| 154      | +388 +35 +311  | +72 +233 +194  | +155 +117 +78 | +39 0 -39     | -78 -117 -155     | -194 -33 -272     | -311 -350 -388    |
| 156      | +335 +3 +268   | +35 +201 +168  | +134 +101 +67 | +34 0 -34     | -67 -101 -134     | -168 -201 -235    | -68 -302 -335     |
| 158      | +85 +256 +8    | +199 +171 +14  | +114 +85 +57  | +28 0 -28     | -57 -85 -114      | -142 -171 -199    | -228 -256 -285    |
| 160      | +36 +1 +188    | +165 +141 +118 | +94 +71 +47   | +4 0 -4       | -47 -71 -94       | -118 -141 -165    | -188 -212 -236    |
| 162      | +189 +170 +151 | +13 +113 +94   | +75 +57 +38   | +19 0 -19     | -38 -57 -75       | -94 -113 -132     | -151 -170 -189    |
| 164      | +143 +19 +115  | +10 +86 +7     | +57 +43 +9    | +14 0 -14     | -9 -43 -57        | -72 -86 -10       | -115 -129 -143    |
| 166      | +99 +90 +80    | +7 +60 +50     | +40 +3 +0     | +10 0 -10     | -20 -30 -40       | -50 -60 -70       | -80 -90 -99       |
| 168      | +57 +51 +46    | +4 +34 +9      | +3 +17 +11    | +6 0 -6       | -11 -17 -23       | -29 -34 -40       | -46 -51 -57       |
| 170      | +16 +14 +13    | +11 +10 +8     | +6 +5 +3      | + 0 -2        | -3 -5 -6          | -8 -10 -11        | -13 -14 -16       |
| 172      | -4 -2 -19      | -17 -14 -1     | -10 -7 -5     | - 0 +2        | +5 +7 +10         | +1 +14 +17        | +19 +2 +24        |
| 174      | -63 -56 -50    | -44 -38 -31    | -5 -19 -13    | -6 0 +6       | +13 +19 +25       | +31 +38 +44       | +50 +56 +63       |
| 176      | -101 -90 -80   | -70 -6 -50     | -40 -30 -20   | -10 0 +10     | +0 +30 +4         | +5 +60 +70        | +80 +90 +101      |
| 178      | -138 -124 -110 | -96 -8 -69     | -55 -41 -7    | -14 0 +14     | +27 +41 +55       | +69 +82 +96       | +110 +124 +138    |
| 180      | -174 -156 -139 | -12 -104 -87   | -69 -52 -35   | -17 0 +17     | +35 +5 +69        | +87 +104 +1       | +139 +156 +174    |
| 182      | -09 -188 -167  | -146 -125 -14  | -84 -63 -4    | -1 0 +1       | +4 +63 +84        | +14 +125 +146     | +167 +188 +09     |
| 184      | -43 -9 -195    | -17 -146 -1    | -97 -73 -49   | -4 0 +4       | +49 +73 +97       | +12 +146 +170     | +195 +19 +243     |
| 186      | -277 -50 -     | -194 -166 -139 | -111 -83 -55  | -8 0 +28      | +55 +83 +111      | +139 +166 +194    | +22 +25 +77       |
| 188      | -311 -80 -248  | -17 -186 -155  | -14 -93 -6    | -31 0 +31     | +6 +93 +124       | +155 +186 +17     | +248 +80 +311     |
| 190      | -343 -309 -275 | -4 -206 -17    | -137 -13 -69  | -34 0 +34     | +69 +103 +137     | +172 +206 +240    | +75 +309 +343     |
| 192      | -375 -338 -30  | -63 -5 -188    | -15 -113 -75  | -38 0 +38     | +75 +113 +150     | +188 +25 +263     | +300 +338 +375    |
| 194      | -407 -366 -326 | -85 -44 -04    | -163 -12 -81  | -41 0 +41     | +81 +12 +163      | +04 +44 +285      | +326 +366 +407    |
| 196      | -438 -394 -351 | -37 -63 -19    | -175 -131 -88 | -44 0 +44     | +88 +131 +175     | +219 +63 +307     | +351 +394 +438    |
| 198      | -469 -4 -375   | -328 -281 -234 | -188 -141 -94 | -47 0 +47     | +94 +141 +188     | +234 +281 +328    | +375 +422 +469    |
| 200      | -499 -449 -399 | -349 -299 -250 | -0 -150 -100  | -50 0 +50     | +10 +150 +200     | +50 +299 +349     | +399 +449 +499    |

This Table contains the correction of high latitudes for the variation of the phenomena. The correction is given in minutes of time for each hour of the day. The correction is to be added to the time of the phenomenon as given in the preceding tables. The correction is to be added to the time of the phenomenon as given in the preceding tables.

# SATELLITE III

## Tables of the Phenomena

**XLIXa**

**Semiduration**

| 1    | 2         | 3                | 4                     | 5                 | 6     |
|------|-----------|------------------|-----------------------|-------------------|-------|
| Lat. | Ecl., Oc. | $\Delta$<br>'001 | $\frac{1}{2}\Delta^2$ | Corr.<br>Sh., Tr. | Lat.  |
| '000 | d<br>...  | ...              | ...                   | ...               | 2'000 |
| '002 | 0'004721  | 1705             | 353                   | - 13              | 1'998 |
| '004 | 6718      | 880              | 59                    | 19                | 1'996 |
| '006 | 8241      | 703              | 29                    | 23                | 1'994 |
| '008 | 9530      | 605              | 20                    | 26                | 1'992 |
| '010 | 10659     | 537              | 14                    | 30                | 1'990 |
| '012 | 0'011678  | 490              | 10                    | - 33              | 1'988 |
| '014 | 12617     | 452              | 8                     | 35                | 1'986 |
| '016 | 13488     | 422              | 7                     | 38                | 1'984 |
| '018 | 14303     | 397              | 5                     | 40                | 1'982 |
| '020 | 15075     | 377              | 5                     | 42                | 1'980 |
| '022 | 0'015810  | 359              | 4                     | - 44              | 1'978 |
| '024 | 16509     | 342              | 4                     | 46                | 1'976 |
| '026 | 17178     | 328              | 3                     | 47                | 1'974 |
| '028 | 17820     | 315              | 3                     | 49                | 1'972 |
| '030 | 18439     | 304              | 3                     | 51                | 1'970 |
| '032 | 0'019037  | 295              | 2                     | - 53              | 1'968 |
| '034 | 19617     | 285              | 2                     | 54                | 1'966 |
| '036 | 20178     | 277              | 2                     | 56                | 1'964 |
| '038 | 20723     | 269              | 2                     | 57                | 1'962 |
| '040 | 21253     | 262              | 2                     | 59                | 1'960 |
| '042 | 0'021769  | 255              | 2                     | - 60              | 1'958 |
| '044 | 22272     | 249              | 1                     | 62                | 1'956 |
| '046 | 22764     | 243              | 1                     | 63                | 1'954 |
| '048 | 23244     | 237              | 1                     | 64                | 1'952 |
| '050 | 23713     | 232              | 1                     | 66                | 1'950 |
| '052 | 0'024172  | 227              | 1                     | - 67              | 1'948 |
| '054 | 24621     | 223              | 1                     | 68                | 1'946 |
| '056 | 25062     | 218              | 1                     | 70                | 1'944 |
| '058 | 25494     | 214              | 1                     | 71                | 1'942 |
| '060 | 25918     | 210              | 1                     | 72                | 1'940 |
| '062 | 0'026335  | 207              | 1                     | - 73              | 1'938 |
| '064 | 26744     | 203              | 1                     | 74                | 1'936 |
| '066 | 27147     | 200              | 1                     | 75                | 1'934 |
| '068 | 27542     | 196              | 1                     | 76                | 1'932 |
| '070 | 27931     | 193              | 1                     | 77                | 1'930 |
| '072 | 0'028313  | 190              | 1                     | - 78              | 1'928 |
| '074 | 28690     | 187              | 1                     | 79                | 1'926 |
| '076 | 29062     | 185              | 1                     | 80                | 1'924 |
| '078 | 29428     | 182              | 1                     | 81                | 1'922 |
| '080 | 29788     | 179              | 1                     | 82                | 1'920 |
| '082 | 0'030144  | 177              | 1                     | - 83              | 1'918 |
| '084 | 30494     | 174              | 1                     | 84                | 1'916 |
| '086 | 30840     | 172              | 1                     | 85                | 1'914 |
| '088 | 31181     | 170              | 1                     | 86                | 1'912 |
| '090 | 31518     | 168              | 1                     | 87                | 1'910 |
| '092 | 0'031851  | 166              | 1                     | - 88              | 1'908 |
| '094 | 32180     | 163              | 1                     | 89                | 1'906 |
| '096 | 32504     | 161              | 1                     | 90                | 1'904 |
| '098 | 32824     | 159              | 0                     | 91                | 1'902 |
| '100 | 0'033142  | 158              | 0                     | - 92              | 1'900 |

| 1    | 2             | 3                | 4                 | 5     |
|------|---------------|------------------|-------------------|-------|
| Lat. | Ecl., Oc.     | $\Delta$<br>'001 | Corr.<br>Sh., Tr. | Lat.  |
| '100 | d<br>0'033142 | 158              | - 92              | 1'900 |
| '102 | 33455         | 156              | 93                | 1'898 |
| '104 | 33764         | 154              | 94                | 1'896 |
| '106 | 34070         | 152              | 94                | 1'894 |
| '108 | 34373         | 151              | 95                | 1'892 |
| '110 | 34672         | 149              | 96                | 1'890 |
| '112 | 0'034968      | 147              | - 97              | 1'888 |
| '114 | 35261         | 146              | 98                | 1'886 |
| '116 | 35551         | 144              | 99                | 1'884 |
| '118 | 35838         | 143              | 99                | 1'882 |
| '120 | 36122         | 141              | 100               | 1'880 |
| '122 | 0'036403      | 140              | - 101             | 1'878 |
| '124 | 36682         | 139              | 102               | 1'876 |
| '126 | 36958         | 137              | 102               | 1'874 |
| '128 | 37231         | 136              | 103               | 1'872 |
| '130 | 37501         | 135              | 104               | 1'870 |
| '132 | 0'037769      | 133              | - 105             | 1'868 |
| '134 | 38034         | 132              | 105               | 1'866 |
| '136 | 38297         | 131              | 106               | 1'864 |
| '138 | 38558         | 130              | 107               | 1'862 |
| '140 | 38816         | 129              | 107               | 1'860 |
| '142 | 0'039072      | 128              | - 108             | 1'858 |
| '144 | 39326         | 126              | 109               | 1'856 |
| '146 | 39577         | 125              | 110               | 1'854 |
| '148 | 39826         | 124              | 110               | 1'852 |
| '150 | 40074         | 123              | 111               | 1'850 |
| '152 | 0'040319      | 122              | - 112             | 1'848 |
| '154 | 40562         | 121              | 112               | 1'846 |
| '156 | 40803         | 120              | 113               | 1'844 |
| '158 | 41042         | 119              | 113               | 1'842 |
| '160 | 41279         | 118              | 114               | 1'840 |
| '162 | 0'041514      | 117              | - 115             | 1'838 |
| '164 | 41747         | 116              | 115               | 1'836 |
| '166 | 41979         | 115              | 116               | 1'834 |
| '168 | 42208         | 114              | 117               | 1'832 |
| '170 | 42436         | 113              | 117               | 1'830 |
| '172 | 0'042661      | 112              | - 118             | 1'828 |
| '174 | 42885         | 112              | 119               | 1'826 |
| '176 | 43108         | 111              | 119               | 1'824 |
| '178 | 43330         | 111              | 120               | 1'822 |
| '180 | 43550         | 110              | 121               | 1'820 |
| '182 | 0'043768      | 109              | - 121             | 1'818 |
| '184 | 43984         | 108              | 122               | 1'816 |
| '186 | 44198         | 107              | 122               | 1'814 |
| '188 | 44410         | 106              | 123               | 1'812 |
| '190 | 44622         | 106              | 123               | 1'810 |
| '192 | 0'044833      | 105              | - 124             | 1'808 |
| '194 | 45041         | 104              | 124               | 1'806 |
| '196 | 45247         | 103              | 125               | 1'804 |
| '198 | 45452         | 102              | 126               | 1'802 |
| '200 | 0'045656      | 101              | - 126             | 1'800 |

| 1    | 2             | 3                | 4                 | 5     |
|------|---------------|------------------|-------------------|-------|
| Lat. | Ecl., Oc.     | $\Delta$<br>'001 | Corr.<br>Sh., Tr. | Lat.  |
| '200 | d<br>0'045656 | 101,3            | - 126             | 1'800 |
| '205 | 46161         | 100,0            | 128               | 1'795 |
| '210 | 46656         | 98,2             | 129               | 1'790 |
| '215 | 47143         | 96,7             | 130               | 1'785 |
| '220 | 47623         | 95,2             | 132               | 1'780 |
| '225 | 48095         | 93,6             | 133               | 1'775 |
| '230 | 0'048559      | 92,0             | - 134             | 1'770 |
| '235 | 49015         | 90,6             | 136               | 1'765 |
| '240 | 49465         | 89,2             | 137               | 1'760 |
| '245 | 49907         | 87,8             | 138               | 1'755 |
| '250 | 50343         | 86,5             | 139               | 1'750 |
| '255 | 0'050772      | 85,1             | - 140             | 1'745 |
| '260 | 51194         | 83,9             | 142               | 1'740 |
| '265 | 51611         | 82,7             | 143               | 1'735 |
| '270 | 52021         | 81,3             | 144               | 1'730 |
| '275 | 52425         | 80,3             | 145               | 1'725 |
| '280 | 0'052824      | 79,1             | - 146             | 1'720 |
| '285 | 53216         | 77,9             | 147               | 1'715 |
| '290 | 53603         | 76,9             | 148               | 1'710 |
| '295 | 53985         | 75,9             | 149               | 1'705 |
| '300 | 54362         | 74,8             | 150               | 1'700 |
| '305 | 0'054733      | 73,7             | - 151             | 1'695 |
| '310 | 55099         | 72,7             | 152               | 1'690 |
| '315 | 55460         | 71,7             | 153               | 1'685 |
| '320 | 55816         | 70,7             | 154               | 1'680 |
| '325 | 56167         | 69,8             | 155               | 1'675 |
| '330 | 0'056514      | 68,8             | - 156             | 1'670 |
| '335 | 56855         | 67,8             | 157               | 1'665 |
| '340 | 57192         | 67,0             | 158               | 1'660 |
| '345 | 57525         | 66,2             | 159               | 1'655 |
| '350 | 57854         | 65,3             | 160               | 1'650 |
| '355 | 0'058178      | 64,4             | - 161             | 1'645 |
| '360 | 58498         | 63,5             | 162               | 1'640 |
| '365 | 58813         | 62,7             | 163               | 1'635 |
| '370 | 59125         | 61,9             | 163               | 1'630 |
| '375 | 59432         | 61,1             | 164               | 1'625 |
| '380 | 0'059736      | 60,3             | - 165             | 1'620 |
| '385 | 60035         | 59,4             | 166               | 1'615 |
| '390 | 60330         | 58,6             | 167               | 1'610 |
| '395 | 60621         | 57,9             | 168               | 1'605 |
| '400 | 60909         | 57,2             | 168               | 1'600 |
| '405 | 0'061193      | 56,5             | - 169             | 1'595 |
| '410 | 61474         | 55,8             | 170               | 1'590 |
| '415 | 61751         | 55,0             | 171               | 1'585 |
| '420 | 62024         | 54,3             | 171               | 1'580 |
| '425 | 62294         | 53,6             | 172               | 1'575 |
| '430 | 0'062560      | 52,9             | - 173             | 1'570 |
| '435 | 62823         | 52,2             | 174               | 1'565 |
| '440 | 63082         | 51,5             | 174               | 1'560 |
| '445 | 63338         | 50,9             | 175               | 1'555 |
| '450 | 0'063591      | 50,2             | - 176             | 1'550 |

Applied Constant: -0'000100.

entry of Table XLVIII.

Col. 4 or 5, and that for Phase from Table LXV must also be applied.

The Argument of Table XLIXa is the Latitude as derived from Tables XXXVII-XLIV, corrected by the

The entry must be corrected further by the entries of Tables LI-LV.

For Shadows and Transits, the correction from

# SATELLITE III

## Tables of the Phenomena

XLIXb

Semiduration—continued

| L t | Ecl Oc              | 3<br>Δ<br>o | 4<br>Co<br>Sh T | 5<br>Lat |
|-----|---------------------|-------------|-----------------|----------|
| 450 | <sup>d</sup> 063191 | 50          | -176            | 1 550    |
| 455 | 63441               | 49 6        | 176             | 1 545    |
| 460 | 63687               | 48 9        | 177             | 1 540    |
| 465 | 63930               | 48 3        | 178             | 1 535    |
| 470 | 6417                | 47 7        | 179             | 1 530    |
| 475 | 64407               | 47 1        | 179             | 1 525    |
| 480 | 064641              | 46 4        | -180            | 1 520    |
| 485 | 64871               | 45 7        | 181             | 1 515    |
| 490 | 65 98               | 45          | 181             | 1 510    |
| 495 | 653 3               | 44 7        | 18              | 1 505    |
| 500 | 65545               | 44 0        | 18              | 1 500    |
| 505 | 065763              | 43 4        | -183            | 1 495    |
| 510 | 65979               | 4 9         | 184             | 1 490    |
| 515 | 6619                | 4 3         | 184             | 1 485    |
| 520 | 66402               | 41 7        | 185             | 1 480    |
| 525 | 666 9               | 41 1        | 185             | 1 475    |
| 530 | 066813              | 40 6        | -186            | 1 470    |
| 535 | 67 15               | 40 1        | 186             | 1 465    |
| 540 | 67 14               | 39 5        | 187             | 1 460    |
| 545 | 6741                | 39          | 187             | 1 455    |
| 550 | 676 4               | 38 5        | 188             | 1 450    |
| 555 | 067795              | 37 9        | -189            | 1 445    |
| 560 | 67983               | 37 3        | 189             | 1 440    |
| 565 | 68168               | 36 8        | 190             | 1 435    |
| 570 | 68351               | 36 3        | 19              | 1 430    |
| 575 | 68531               | 35 8        | 19              | 1 425    |
| 580 | 0687 9              | 35 3        | -191            | 1 420    |
| 585 | 68884               | 34 8        | 19              | 1 415    |
| 590 | 69 57               | 34 3        | 19              | 1 410    |
| 595 | 69 7                | 33 8        | 19              | 1 405    |
| 600 | 69395               | 33 3        | 193             | 1 400    |
| 605 | 069560              | 3 8         | -193            | 1 395    |
| 610 | 69723               | 3 3         | 194             | 1 390    |
| 615 | 69883               | 31 8        | 194             | 1 385    |
| 620 | 70041               | 31 4        | 195             | 1 380    |
| 625 | 70197               | 30 8        | 195             | 1 375    |
| 630 | 070349              | 30 3        | -195            | 1 370    |
| 635 | 70500               | 9 9         | 196             | 1 365    |
| 640 | 70648               | 9 4         | 196             | 1 360    |
| 645 | 70794               | 28 9        | 197             | 1 355    |
| 650 | 70937               | 8 5         | 197             | 1 350    |
| 655 | 071079              | 28 2        | -198            | 1 345    |
| 660 | 71 19               | 7 6         | 198             | 1 340    |
| 665 | 71355               | 7           | 198             | 1 335    |
| 670 | 7149                | 26 7        | 199             | 1 330    |
| 675 | 716                 | 26 2        | 199             | 1 325    |
| 680 | 07175               | 5 8         | -200            | 1 320    |
| 685 | 71880               | 5 3         | 200             | 1 315    |
| 690 | 7 0 5               | 4 8         | 200             | 1 310    |
| 695 | 721 8               | 24 4        | 200             | 1 305    |
| 700 | 07 249              | 4 0         | - 01            | 1 300    |

| Lat | Ecl Oc | 3<br>Δ<br>oor | 4<br>Cor<br>Sh Tr | 5<br>Lat |
|-----|--------|---------------|-------------------|----------|
| 700 | 07 249 | 24            | - 1               | 1 300    |
| 705 | 7 368  | 3 6           | 01                | 1 295    |
| 710 | 7 485  | 3 1           | 01                | 1 290    |
| 715 | 7 599  | 2 6           | 0                 | 1 285    |
| 720 | 7 711  |               | 20                | 1 280    |
| 725 | 728 1  | 1 8           | 2                 | 1 275    |
| 730 | 072929 | 1 4           | - 03              | 1 270    |
| 735 | 73 35  | 21            | 03                | 1 265    |
| 740 | 73139  | 0 5           | 03                | 1 260    |
| 745 | 7324   | 1             | 203               | 1 255    |
| 750 | 73340  | 19 7          | 04                | 1 250    |
| 755 | 073437 | 19 3          | -204              | 1 245    |
| 760 | 73533  | 18 9          | 04                | 1 240    |
| 765 | 736 6  | 18 4          | 05                | 1 235    |
| 770 | 73717  | 18 0          | 205               | 1 230    |
| 775 | 73806  | 17 6          | 205               | 1 225    |
| 780 | 073893 | 17            | -206              | 1 220    |
| 785 | 73978  | 16 8          | 06                | 1 215    |
| 790 | 74061  | 16 4          | 06                | 1 210    |
| 795 | 7414   | 16            | 06                | 1 205    |
| 800 | 74 1   | 15 5          | 06                | 1 200    |
| 805 | 074297 | 15 1          | - 06              | 1 195    |
| 810 | 7437   | 14 8          | 07                | 1 190    |
| 815 | 74445  | 14 4          | 07                | 1 185    |
| 820 | 74516  | 14 0          | 7                 | 1 180    |
| 825 | 74585  | 13 6          | 07                | 1 175    |
| 830 | 07465  | 13 1          | - 08              | 1 170    |
| 835 | 74716  | 12 7          | 08                | 1 165    |
| 840 | 74779  | 1 4           | 08                | 1 160    |
| 845 | 7484   | 1 0           | 208               | 1 155    |
| 850 | 74899  | 11 6          | 8                 | 1 150    |
| 855 | 074956 | 11 2          | - 09              | 1 145    |
| 860 | 75011  | 10 7          | 2 9               | 1 140    |
| 865 | 75063  | 1 3           | 09                | 1 135    |
| 870 | 75114  | 10 0          | 209               | 1 130    |
| 875 | 75163  | 9 6           | 9                 | 1 125    |
| 880 | 075210 | 9 3           | - 09              | 1 120    |
| 885 | 75256  | 8 9           | 209               | 1 115    |
| 890 | 75 99  | 8 4           | 209               | 1 110    |
| 895 | 75340  | 8 1           | 209               | 1 105    |
| 900 | 7538   | 7 7           | 09                | 1 100    |
| 905 | 075417 | 7             | -209              | 1 095    |
| 910 | 7545   | 6 9           | 10                | 1 090    |
| 915 | 75486  | 6 5           | 21                | 1 085    |
| 920 | 75517  | 6 1           | 210               | 1 080    |
| 925 | 75547  | 5 7           | 21                | 1 075    |
| 930 | 075574 | 5 3           | - 10              | 1 070    |
| 935 | 75600  | 5 0           | 21                | 1 065    |
| 940 | 756 4  | 4 6           | 210               | 1 060    |
| 945 | 75646  | 4             | 210               | 1 055    |
| 950 | 075666 | 3 9           | - 10              | 1 050    |

| Lat   | Ecl Oc | 3<br>Δ<br>oo | 4<br>Cor<br>Sh Tr | 5<br>Lat |
|-------|--------|--------------|-------------------|----------|
| 950   | 075666 | 3 9          | -210              | 1 050    |
| 955   | 75685  | 3 5          | 210               | 1 045    |
| 960   | 757 1  | 3 0          | 210               | 1 040    |
| 965   | 75715  | 6            | 210               | 1 035    |
| 970   | 757 7  | 3            | 1                 | 1 030    |
| 975   | 75738  | 1 9          | 1                 | 1 025    |
| 980   | 075746 | 1 5          | -210              | 1 020    |
| 985   | 75753  | 1            | 211               | 1 015    |
| 990   | 75758  | 0 8          | 211               | 1 010    |
| 995   | 75761  | 0 4          | 211               | 1 005    |
| 1 000 | 075762 | 0            | -211              | 1 000    |

Add l o t t oo oo ll Ag t f  
 tl l l l l tl L tl d l i d f l l  
 XXXVII XLIV  
 ll ty t b t d ly tl tl f  
 T ll L IV I Sl dw d l it tl rr  
 tl f m l m t t b ppl d l l th t  
 f J pit pl f m T bl LXV

# SATELLITE III

## Tables of the Phenomena

### Equation of Semiduration

L

| Var.<br>Lat. | - '010 - '009 - '008 |     |     | - '007 - '006 - '005 |     |     | - '004 - '003 - '002 |     |     | - '001 '000 + '001 |     |     | + '002 + '003 + '004 |     |     | + '005 + '006 + '007 |     |     | + '008 + '009 + '010 |     |     | Var.<br>Lat. |
|--------------|----------------------|-----|-----|----------------------|-----|-----|----------------------|-----|-----|--------------------|-----|-----|----------------------|-----|-----|----------------------|-----|-----|----------------------|-----|-----|--------------|
| '44          | 228                  | 245 | 262 | 280                  | 297 | 314 | 331                  | 348 | 366 | 383                | 400 | 417 | 434                  | 452 | 469 | 486                  | 503 | 520 | 538                  | 555 | 572 | 1'56         |
| '46          | 211                  | 230 | 249 | 268                  | 287 | 305 | 324                  | 343 | 362 | 381                | 400 | 419 | 438                  | 457 | 476 | 495                  | 513 | 532 | 551                  | 570 | 589 | 1'54         |
| '48          | 195                  | 215 | 236 | 256                  | 277 | 297 | 318                  | 338 | 359 | 379                | 400 | 421 | 441                  | 462 | 482 | 503                  | 523 | 544 | 564                  | 585 | 605 | 1'52         |
| '50          | 179                  | 202 | 224 | 246                  | 268 | 290 | 312                  | 334 | 356 | 378                | 400 | 422 | 444                  | 466 | 488 | 510                  | 532 | 554 | 576                  | 598 | 621 | 1'50         |
|              |                      |     |     |                      |     |     |                      |     |     |                    |     |     |                      |     |     |                      |     |     |                      |     |     |              |
| '52          | 165                  | 189 | 212 | 235                  | 259 | 283 | 306                  | 329 | 353 | 377                | 400 | 423 | 447                  | 471 | 494 | 517                  | 541 | 565 | 588                  | 611 | 635 | 1'48         |
| '54          | 151                  | 177 | 201 | 226                  | 251 | 276 | 301                  | 325 | 350 | 375                | 400 | 425 | 450                  | 475 | 499 | 524                  | 549 | 574 | 599                  | 623 | 649 | 1'46         |
| '56          | 139                  | 165 | 191 | 217                  | 243 | 270 | 296                  | 322 | 347 | 374                | 400 | 426 | 453                  | 478 | 504 | 530                  | 557 | 583 | 609                  | 635 | 661 | 1'44         |
| '58          | 127                  | 155 | 182 | 209                  | 236 | 264 | 291                  | 318 | 345 | 373                | 400 | 427 | 455                  | 482 | 509 | 536                  | 564 | 591 | 618                  | 645 | 673 | 1'42         |
| '60          | 116                  | 145 | 173 | 201                  | 230 | 258 | 287                  | 315 | 343 | 372                | 400 | 428 | 457                  | 485 | 513 | 542                  | 570 | 599 | 627                  | 655 | 684 | 1'40         |
|              |                      |     |     |                      |     |     |                      |     |     |                    |     |     |                      |     |     |                      |     |     |                      |     |     |              |
| '62          | 106                  | 136 | 165 | 194                  | 223 | 253 | 282                  | 312 | 341 | 371                | 400 | 429 | 459                  | 488 | 518 | 547                  | 577 | 606 | 635                  | 664 | 694 | 1'38         |
| '64          | 96                   | 127 | 157 | 187                  | 218 | 249 | 279                  | 309 | 339 | 370                | 400 | 430 | 461                  | 491 | 521 | 551                  | 582 | 613 | 643                  | 673 | 704 | 1'36         |
| '66          | 87                   | 119 | 150 | 181                  | 212 | 244 | 275                  | 306 | 337 | 369                | 400 | 431 | 463                  | 494 | 525 | 556                  | 588 | 619 | 650                  | 681 | 713 | 1'34         |
| '68          | 79                   | 111 | 143 | 175                  | 207 | 240 | 272                  | 304 | 335 | 368                | 400 | 432 | 465                  | 496 | 528 | 560                  | 593 | 625 | 657                  | 689 | 721 | 1'32         |
| '70          | 71                   | 104 | 137 | 170                  | 202 | 236 | 269                  | 301 | 334 | 367                | 400 | 433 | 466                  | 499 | 531 | 564                  | 598 | 630 | 663                  | 696 | 729 | 1'30         |
|              |                      |     |     |                      |     |     |                      |     |     |                    |     |     |                      |     |     |                      |     |     |                      |     |     |              |
| '72          | 64                   | 98  | 131 | 165                  | 198 | 232 | 266                  | 299 | 332 | 367                | 400 | 433 | 468                  | 501 | 534 | 568                  | 602 | 635 | 669                  | 702 | 736 | 1'28         |
| '74          | 57                   | 92  | 126 | 160                  | 194 | 229 | 263                  | 297 | 331 | 366                | 400 | 434 | 469                  | 503 | 537 | 571                  | 606 | 640 | 674                  | 708 | 743 | 1'26         |
| '76          | 51                   | 87  | 121 | 156                  | 190 | 226 | 261                  | 295 | 330 | 365                | 400 | 435 | 470                  | 505 | 539 | 574                  | 610 | 644 | 679                  | 713 | 749 | 1'24         |
| '78          | 45                   | 81  | 117 | 152                  | 187 | 223 | 258                  | 294 | 329 | 365                | 400 | 435 | 471                  | 506 | 542 | 577                  | 613 | 648 | 683                  | 719 | 755 | 1'22         |
| '80          | 40                   | 77  | 113 | 148                  | 184 | 221 | 256                  | 292 | 328 | 364                | 400 | 436 | 472                  | 508 | 544 | 579                  | 616 | 652 | 687                  | 723 | 760 | 1'20         |
|              |                      |     |     |                      |     |     |                      |     |     |                    |     |     |                      |     |     |                      |     |     |                      |     |     |              |
| '82          | 36                   | 73  | 109 | 145                  | 181 | 218 | 254                  | 291 | 327 | 364                | 400 | 436 | 473                  | 509 | 546 | 582                  | 619 | 655 | 691                  | 727 | 764 | 1'18         |
| '84          | 32                   | 70  | 106 | 143                  | 179 | 217 | 253                  | 290 | 326 | 364                | 400 | 436 | 474                  | 510 | 547 | 583                  | 621 | 657 | 694                  | 730 | 768 | 1'16         |
| '86          | 28                   | 66  | 103 | 140                  | 177 | 215 | 252                  | 288 | 325 | 363                | 400 | 437 | 475                  | 512 | 548 | 585                  | 623 | 660 | 697                  | 734 | 772 | 1'14         |
| '88          | 25                   | 64  | 101 | 138                  | 175 | 213 | 250                  | 288 | 325 | 363                | 400 | 437 | 475                  | 512 | 550 | 587                  | 625 | 662 | 699                  | 736 | 775 | 1'12         |
| '90          | 23                   | 61  | 99  | 136                  | 173 | 212 | 249                  | 287 | 324 | 363                | 400 | 437 | 476                  | 513 | 551 | 588                  | 627 | 664 | 701                  | 739 | 777 | 1'10         |
|              |                      |     |     |                      |     |     |                      |     |     |                    |     |     |                      |     |     |                      |     |     |                      |     |     |              |
| '92          | 21                   | 59  | 97  | 135                  | 172 | 211 | 249                  | 286 | 324 | 362                | 400 | 438 | 476                  | 514 | 551 | 589                  | 628 | 665 | 703                  | 741 | 779 | 1'08         |
| '94          | 19                   | 58  | 96  | 133                  | 171 | 210 | 248                  | 286 | 323 | 362                | 400 | 438 | 477                  | 514 | 552 | 590                  | 629 | 667 | 704                  | 742 | 781 | 1'06         |
| '96          | 18                   | 57  | 95  | 133                  | 170 | 209 | 247                  | 285 | 323 | 362                | 400 | 438 | 477                  | 515 | 553 | 591                  | 630 | 667 | 705                  | 743 | 782 | 1'04         |
| '98          | 17                   | 56  | 94  | 132                  | 170 | 209 | 247                  | 285 | 323 | 362                | 400 | 438 | 477                  | 515 | 553 | 591                  | 630 | 668 | 706                  | 744 | 783 | 1'02         |
| 1'00         | 17                   | 56  | 94  | 132                  | 170 | 209 | 247                  | 285 | 323 | 362                | 400 | 438 | 477                  | 515 | 553 | 591                  | 630 | 668 | 706                  | 744 | 783 | 1'00         |

Applied Constant: +400. The unit in this Table equals 0<sup>h</sup>000001.

This Table is complementary to Table XLVIII. It shows a correction to be applied to the Semiduration as derived from Table XLIX<sup>b</sup>, due to the Variation, when the Latitude as found from Tables XXXVII-XLIV lies between '45 and 1'55.

# SATELLITE III

## Tables of the Phenomena

### Equations of Semiduration

| LI     |          |          |          | LII             |    |    |    |    |    |    |    |    |    |    |    |
|--------|----------|----------|----------|-----------------|----|----|----|----|----|----|----|----|----|----|----|
| Ecl Oc |          |          |          | Ecl, Oc, Sh, Tr |    |    |    |    |    |    |    |    |    |    |    |
|        | Ecl Oc   | $\alpha$ | Ecl Oc   | Lat<br>$\beta$  | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 |
|        |          |          |          |                 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 |    |
| 0      | + 000017 | 2400     | - 000016 | d               | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 200    | 16       | 2600     | 14       | 20              | 10 | 11 | 11 | 11 | 12 | 1  | 1  | 12 | 1  | 1  | 1  |
| 400    | 14       | 2800     | 10       | 40              | 10 | 1  | 1  | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 |
| 600    | 11       | 3000     | 6        | 60              | 10 | 13 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 16 | 16 |
| 800    | 7        | 3200     | - 1      | 80              | 1  | 13 | 14 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 |
| 1000   | +        | 3400     | +        | 100             | 10 | 13 | 14 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 |
| 1200   | - 0 0003 | 3600     | + 0 0008 | 120             | 10 | 13 | 14 | 15 | 16 | 16 | 16 | 17 | 17 | 17 | 17 |
| 1400   | 8        | 3800     | 1        | 140             | 1  | 13 | 14 | 14 | 15 | 15 | 16 | 16 | 16 | 16 | 16 |
| 1600   | 12       | 4000     | 15       | 160             | 1  | 1  | 12 | 13 | 13 | 13 | 14 | 14 | 14 | 14 | 14 |
| 1800   | 15       | 4200     | 17       | 180             | 10 | 11 | 11 | 11 | 1  | 12 | 12 | 12 | 12 | 1  | 1  |
| 2000   | 17       | 4400     | 17       | 200             | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2200   | - 000017 | 4600     | + 000016 | 220             | 10 | 9  | 9  | 9  | 8  | 8  | 8  | 8  | 8  | 8  | 8  |
| 2400   | 16       | 4800     | 13       | 240             | 10 | 8  | 8  | 7  | 7  | 7  | 6  | 6  | 6  | 6  | 6  |
| 2600   | 000014   | 5000     | + 00001  | 260             | 10 | 7  | 6  | 6  | 5  | 5  | 4  | 4  | 4  | 4  | 4  |
|        |          |          |          | 280             | 10 | 7  | 6  | 5  | 4  | 4  | 4  | 3  | 3  | 3  | 3  |
|        |          |          |          | 300             | 10 | 7  | 6  | 5  | 4  | 4  | 4  | 3  | 3  | 3  | 3  |
|        |          |          |          | 320             | 10 | 7  | 6  | 5  | 4  | 4  | 4  | 3  | 3  | 3  | 3  |
|        |          |          |          | 340             | 10 | 7  | 6  | 6  | 5  | 5  | 4  | 4  | 4  | 4  | 4  |
|        |          |          |          | 360             | 10 | 8  | 8  | 7  | 7  | 7  | 6  | 6  | 6  | 6  | 6  |
|        |          |          |          | 380             | 10 | 9  | 9  | 9  | 8  | 8  | 8  | 8  | 8  | 8  | 8  |
|        |          |          |          | 400             | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |

N C t t l b l l d      Appl d C t t + 000      El it l l 00 00

LIII

Oc, Tr

| Lat<br>β | 1 98 1 96 1 94 | 1 92 1 90 1 88 | 1 86 1 84 1 82 | 1 8 1 7 1 6 | 1 5 1 4 1 3 | 1 2 1 1 1 0 |
|----------|----------------|----------------|----------------|-------------|-------------|-------------|
|          | 02 04 06       | 08 10 12       | 14 16 18       | 2 3 4       | 5 6 7       | 8 9 10      |
| d        |                |                |                |             |             |             |
| 0        | ±101 ±71 ±59   | ±51 ±46 ±4     | ±39 ±37 ±35    | ±33 ±28 ±25 | ±23 ±2 ±21  | ±20 ±20 ±0  |
| 20       | 96 68 56       | 48 44 40       | 37 35 33       | 32 27 4     | 22 1 20     | 19 19 19    |
| 40       | 8 57 47        | 41 37 34       | 31 9 28        | 7 22 20     | 18 17 17    | 16 16 16    |
| 60       | 60 43 35       | 31 7 5         | 4 2 21         | 0 17 15     | 14 13 13    | 12 1 12     |
| 80       | ±3 ± ±18       | ±15 ±14 ±13    | ±1 ±11 ±1      | ±10 ±8 ±8   | ±7 ±7 ±6    | ±6 ±6 ±6    |
| 100      | 0 0 0          | 0 0 0          | 0 0 0          | 0 0 0       | 0 0 0       | 0 0 0       |
| 120      | ±30 ±21 ±18    | ±15 ±14 ±13    | ±1 ±11 ±10     | ±10 ±8 ±8   | ±7 ±7 ±6    | ±6 ±6 ±6    |
| 140      | 60 43 35       | 31 7 25        | 4 1            | 20 17 15    | 14 13 13    | 12 12 1     |
| 160      | 80 57 47       | 41 37 34       | 31 9 8         | 7 2 20      | 18 17 17    | 16 16 16    |
| 180      | 96 68 56       | 48 44 40       | 37 35 33       | 3 7 24      | 2 1 20      | 19 19 19    |
| 200      | 101 71 59      | 51 46 42       | 39 37 35       | 33 8 5      | 23 22 21    | 0 20 20     |
| 220      | ±96 ±68 ±56    | ±48 ±44 ±40    | ±37 ±35 ±33    | ±3 ±7 ±24   | ±22 ±21 ±20 | ±19 ±19 ±19 |
| 240      | 80 57 47       | 41 37 34       | 31 9 28        | 7 22 20     | 18 17 17    | 16 16 16    |
| 260      | 6 43 35        | 31 7 25        | 24 22 21       | 0 17 15     | 14 13 13    | 12 12 12    |
| 280      | ±30 ±21 ±18    | ±15 ±14 ±13    | ±12 ±11 ±10    | ±10 ±8 ±8   | ±7 ±7 ±6    | ±6 ±6 ±6    |
| 300      | 0 0 0          | 0 0 0          | 0 0 0          | 0 0 0       | 0 0 0       | 0 0 0       |
| 320      | ±30 ±21 ±18    | ±15 ±14 ±13    | ±12 ±11 ±10    | ±10 ±8 ±8   | ±7 ±7 ±6    | ±6 ±6 ±6    |
| 340      | 60 43 35       | 31 7 25        | 24 2 1         | 2 17 15     | 14 13 13    | 12 12 12    |
| 360      | 80 57 47       | 41 37 34       | 31 9 28        | 27 2 0      | 18 17 17    | 16 16 16    |
| 380      | 96 68 56       | 48 44 40       | 37 35 33       | 32 27 24    | 22 21 0     | 19 19 19    |
| 400      | ±101 ±71 ±59   | ±51 ±46 ±4     | ±39 ±37 ±35    | ±33 ±28 ±25 | ±23 ±22 ±21 | ±20 ±20 ±20 |

Th pp gn ppl t O lt t th lw t T t

N C th b dd d

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# SATELLITE III

## Tables of the Phenomena

LIV

Equation of Semiduration

Ecl., Oc.

| $\begin{matrix} S \\ O \end{matrix}$ | $0^d.0$ | $0^d.4$ | $0^d.8$ | $1^d.2$ | $1^d.6$ | $2^d.0$ | $2^d.4$ | $2^d.8$ | $3^d.2$ | $3^d.6$ | $4^d.0$ | $4^d.4$ | $4^d.8$ | $5^d.2$ | $5^d.6$ | $6^d.0$ | $6^d.4$ | $6^d.8$ | $7^d.2$ | $7^d.6$ | $8^d.0$ |
|--------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| $0^d.0$                              | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      |
| $0^d.2$                              | 92      | 93      | 93      | 93      | 94      | 93      | 93      | 92      | 92      | 91      | 91      | 91      | 90      | 90      | 90      | 91      | 91      | 92      | 93      | 93      | 93      |
| $0^d.4$                              | 98      | 99      | 100     | 100     | 100     | 100     | 99      | 98      | 97      | 96      | 95      | 94      | 94      | 94      | 94      | 95      | 96      | 97      | 98      | 99      | 99      |
| $0^d.6$                              | 107     | 109     | 110     | 110     | 110     | 109     | 108     | 106     | 104     | 102     | 101     | 100     | 100     | 100     | 101     | 102     | 104     | 105     | 107     | 109     | 110     |
| $0^d.8$                              | 116     | 118     | 120     | 121     | 120     | 119     | 117     | 114     | 111     | 109     | 106     | 105     | 105     | 105     | 106     | 108     | 111     | 114     | 116     | 118     | 110     |
| $1^d.0$                              | 123     | 126     | 128     | 129     | 129     | 127     | 124     | 120     | 116     | 113     | 110     | 109     | 108     | 109     | 111     | 114     | 117     | 120     | 124     | 127     | 129     |
| $1^d.2$                              | 126     | 129     | 132     | 134     | 133     | 131     | 128     | 124     | 119     | 115     | 112     | 110     | 109     | 110     | 112     | 115     | 118     | 122     | 126     | 130     | 133     |
| $1^d.4$                              | 125     | 129     | 133     | 135     | 135     | 133     | 129     | 125     | 119     | 115     | 112     | 110     | 109     | 109     | 111     | 114     | 117     | 121     | 126     | 130     | 133     |
| $1^d.6$                              | 120     | 125     | 130     | 134     | 135     | 134     | 130     | 126     | 120     | 115     | 110     | 107     | 106     | 105     | 106     | 108     | 112     | 116     | 121     | 126     | 131     |
| $1^d.8$                              | 118     | 123     | 129     | 133     | 136     | 135     | 133     | 128     | 123     | 118     | 113     | 110     | 107     | 106     | 106     | 108     | 110     | 114     | 118     | 124     | 129     |
| $2^d.0$                              | 115     | 120     | 126     | 131     | 134     | 135     | 133     | 130     | 125     | 120     | 116     | 112     | 109     | 107     | 107     | 107     | 109     | 112     | 116     | 121     | 126     |
| $2^d.2$                              | 116     | 120     | 125     | 130     | 134     | 135     | 135     | 133     | 130     | 125     | 121     | 117     | 114     | 111     | 110     | 109     | 110     | 113     | 116     | 121     | 126     |
| $2^d.4$                              | 114     | 117     | 122     | 126     | 129     | 131     | 131     | 130     | 127     | 124     | 120     | 116     | 113     | 111     | 109     | 109     | 109     | 111     | 114     | 118     | 122     |
| $2^d.6$                              | 111     | 114     | 118     | 121     | 124     | 126     | 127     | 126     | 124     | 121     | 118     | 115     | 112     | 109     | 108     | 107     | 107     | 109     | 111     | 114     | 118     |
| $2^d.8$                              | 108     | 111     | 114     | 117     | 119     | 120     | 120     | 120     | 118     | 115     | 112     | 110     | 107     | 105     | 104     | 104     | 104     | 106     | 108     | 111     | 114     |
| $3^d.0$                              | 102     | 104     | 106     | 108     | 109     | 110     | 110     | 109     | 108     | 106     | 105     | 103     | 101     | 100     | 99      | 99      | 100     | 101     | 102     | 104     | 106     |
| $3^d.2$                              | 95      | 96      | 98      | 99      | 99      | 100     | 100     | 99      | 99      | 97      | 96      | 95      | 94      | 93      | 93      | 93      | 94      | 94      | 95      | 97      | 98      |
| $3^d.4$                              | 92      | 92      | 93      | 93      | 93      | 93      | 93      | 93      | 92      | 92      | 91      | 91      | 90      | 90      | 90      | 90      | 91      | 91      | 92      | 92      | 93      |
| $3^d.6$                              | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      |
| $3^d.8$                              | 92      | 91      | 91      | 90      | 90      | 90      | 91      | 91      | 91      | 93      | 93      | 94      | 94      | 94      | 94      | 94      | 93      | 92      | 92      | 91      | 90      |
| $4^d.0$                              | 97      | 96      | 95      | 95      | 94      | 95      | 95      | 96      | 98      | 99      | 100     | 101     | 101     | 101     | 101     | 100     | 99      | 98      | 97      | 96      | 95      |
| $4^d.2$                              | 103     | 102     | 101     | 100     | 100     | 101     | 102     | 104     | 106     | 108     | 110     | 111     | 112     | 112     | 111     | 109     | 107     | 105     | 103     | 102     | 100     |
| $4^d.4$                              | 108     | 106     | 105     | 105     | 105     | 107     | 109     | 111     | 114     | 117     | 119     | 121     | 121     | 121     | 119     | 117     | 114     | 111     | 108     | 106     | 105     |
| $4^d.6$                              | 113     | 110     | 109     | 108     | 109     | 111     | 113     | 117     | 120     | 124     | 127     | 129     | 130     | 129     | 127     | 124     | 120     | 116     | 113     | 110     | 109     |
| $4^d.8$                              | 115     | 112     | 110     | 109     | 109     | 111     | 114     | 117     | 121     | 125     | 129     | 132     | 134     | 133     | 131     | 127     | 123     | 119     | 114     | 111     | 109     |
| $5^d.0$                              | 115     | 111     | 109     | 108     | 108     | 110     | 113     | 116     | 120     | 125     | 129     | 133     | 135     | 136     | 133     | 129     | 124     | 119     | 114     | 111     | 109     |
| $5^d.2$                              | 117     | 113     | 110     | 108     | 108     | 109     | 111     | 114     | 118     | 123     | 128     | 133     | 136     | 138     | 136     | 132     | 127     | 122     | 117     | 113     | 110     |
| $5^d.4$                              | 119     | 114     | 110     | 108     | 106     | 107     | 107     | 109     | 113     | 117     | 122     | 128     | 133     | 135     | 136     | 133     | 129     | 124     | 118     | 114     | 110     |
| $5^d.6$                              | 122     | 118     | 113     | 110     | 108     | 107     | 107     | 109     | 111     | 115     | 120     | 126     | 130     | 134     | 135     | 134     | 131     | 127     | 122     | 117     | 113     |
| $5^d.8$                              | 124     | 120     | 115     | 112     | 109     | 108     | 108     | 109     | 111     | 115     | 119     | 124     | 129     | 133     | 134     | 134     | 132     | 128     | 124     | 119     | 115     |
| $6^d.0$                              | 125     | 121     | 117     | 114     | 111     | 109     | 108     | 109     | 111     | 114     | 118     | 122     | 126     | 130     | 131     | 132     | 131     | 128     | 125     | 121     | 117     |
| $6^d.2$                              | 120     | 117     | 114     | 111     | 109     | 107     | 107     | 107     | 109     | 112     | 115     | 118     | 122     | 124     | 126     | 126     | 125     | 123     | 120     | 117     | 114     |
| $6^d.4$                              | 113     | 110     | 108     | 105     | 104     | 103     | 102     | 103     | 104     | 106     | 108     | 111     | 114     | 116     | 117     | 117     | 116     | 115     | 113     | 110     | 107     |
| $6^d.6$                              | 104     | 102     | 101     | 99      | 98      | 97      | 97      | 97      | 98      | 100     | 102     | 103     | 105     | 106     | 107     | 107     | 107     | 105     | 104     | 102     | 100     |
| $6^d.8$                              | 97      | 96      | 94      | 93      | 93      | 93      | 93      | 93      | 94      | 95      | 96      | 97      | 98      | 99      | 99      | 99      | 98      | 98      | 97      | 95      | 94      |
| $7^d.0$                              | 91      | 91      | 90      | 90      | 90      | 90      | 90      | 90      | 91      | 91      | 92      | 92      | 93      | 93      | 93      | 93      | 92      | 92      | 91      | 91      | 90      |
| $7^d.2$                              | 90      | 90      | 91      | 91      | 91      | 91      | 91      | 91      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 90      | 91      |
| $7^d.4$                              | 93      | 94      | 95      | 95      | 95      | 95      | 94      | 94      | 93      | 92      | 92      | 92      | 91      | 91      | 91      | 92      | 92      | 93      | 94      | 94      | 95      |
| $7^d.6$                              | 100     | 101     | 102     | 103     | 103     | 102     | 101     | 100     | 98      | 96      | 95      | 95      | 94      | 94      | 95      | 96      | 97      | 99      | 100     | 101     | 102     |
| $7^d.8$                              | 109     | 111     | 113     | 113     | 113     | 112     | 110     | 108     | 106     | 104     | 102     | 100     | 100     | 100     | 101     | 103     | 105     | 107     | 109     | 111     | 113     |
| $8^d.0$                              | 117     | 119     | 121     | 122     | 121     | 120     | 117     | 114     | 111     | 108     | 106     | 105     | 105     | 105     | 107     | 109     | 112     | 115     | 117     | 120     | 121     |

Applied Constant: + 90. The unit in this Table equals 0<sup>h</sup>.000000.

# SATELLITE III

## Tables of the Phenomena

| LV                 | Equation of Semiduration                         |  |  |  |  |  |  |  |  |  |  |  | Sh, Tr |
|--------------------|--|--|--|--|--|--|--|--|--|--|--|--|--------|
| <div>S<br/>O</div> | 0 <sup>d</sup> 00 <sup>d</sup> 40 <sup>d</sup> 8 | 1 <sup>d</sup> 21 <sup>d</sup> 62 <sup>d</sup> 0 | 2 <sup>d</sup> 42 <sup>d</sup> 83 <sup>d</sup> 2 | 3 <sup>d</sup> 64 <sup>d</sup> 04 <sup>d</sup> 4 | 4 <sup>d</sup> 85 <sup>d</sup> 25 <sup>d</sup> 6 | 6 <sup>d</sup> 06 <sup>d</sup> 46 <sup>d</sup> 8 | 7 <sup>d</sup> 27 <sup>d</sup> 68 <sup>d</sup> 0 |  |  |  |  |  |        |
| 00                 | 23   | 24257  | 82930  | 30329  | 82725  | 242322   | 22223  |  |  |  |  |  |        |
| 02                 | 7289   | 30333  | 343435   | 343332   | 302927   | 27267  | 282829   |  |  |  |  |  |        |
| 04                 | 41444  | 454748   | 484747   | 46444  | 414038   | 383939   | 414243   |  |  |  |  |  |        |
| 06                 | 616365   | 666768   | 676664   | 66058  | 575656   | 565759   | 616365   |  |  |  |  |  |        |
| 08                 | 88588  | 909090   | 888683   | 807775   | 747373   | 747780   | 828588   |  |  |  |  |  |        |
| 10                 | 10115107   | 109110109  | 10610298   | 95919  | 888889   | 929598   | 102106109  |  |  |  |  |  |        |
| 12                 | 11411711   | 12413122   | 119115110  | 106101   | 989910   | 103106110  | 11411912   |  |  |  |  |  |        |
| 14                 | 10124128   | 13113119   | 126122116  | 111108106  | 105104106  | 109112116  | 12115128   |  |  |  |  |  |        |
| 16                 | 1191419  | 133134133  | 12915119   | 114109106  | 105104105  | 107111115  | 120125130  |  |  |  |  |  |        |
| 18                 | 1181319  | 133136135  | 1331813  | 118113110  | 107106106  | 108110114  | 11814129   |  |  |  |  |  |        |
| 20                 | 1411915  | 130133134  | 131913   | 118114110  | 107106106  | 106108111  | 115120125  |  |  |  |  |  |        |
| 22                 | 1111611  | 126130130  | 13018124   | 119115111  | 108105105  | 104105109  | 111117122  |  |  |  |  |  |        |
| 24                 | 14107112   | 11611910   | 120118114  | 111107103  | 1009897  | 9798100  | 10410811   |  |  |  |  |  |        |
| 26                 | 929599   | 1210516  | 106104102  | 98959  | 898686   | 868790   | 929599   |  |  |  |  |  |        |
| 28                 | 788184   | 878888   | 878683   | 807675   | 77171  | 727375   | 788184   |  |  |  |  |  |        |
| 30                 | 616365   | 666666   | 656361   | 595755   | 545454   | 555759   | 616365   |  |  |  |  |  |        |
| 32                 | 444546   | 474645   | 44441  | 383737   | 373738   | 394142   | 444646   |  |  |  |  |  |        |
| 34                 | 343434   | 34331  | 3086   | 26526  | 262728   | 303132   | 343434   |  |  |  |  |  |        |
| 36                 | 3039   | 875  | 423  | 223  | 24257  | 282930   | 30309  |  |  |  |  |  |        |
| 38                 | 353433   | 3198   | 876  | 8931   | 323335   | 363635   | 35343  |  |  |  |  |  |        |
| 40                 | 484644   | 434141   | 404042   | 434546   | 484950   | 505049   | 484644   |  |  |  |  |  |        |
| 42                 | 646361   | 595757   | 575961   | 636668   | 707171   | 706866   | 646259   |  |  |  |  |  |        |
| 44                 | 817876   | 757475   | 777881   | 858790   | 919291   | 908784   | 817876   |  |  |  |  |  |        |
| 46                 | 969391   | 99991  | 99699  | 104107110  | 112111110  | 107104100  | 969391   |  |  |  |  |  |        |
| 48                 | 1713101  | 999910   | 1316110  | 11411812   | 1251412  | 119115111  | 10610210   |  |  |  |  |  |        |
| 50                 | 1118106  | 10410416   | 108111115  | 12012519   | 131133130  | 126121116  | 111108106  |  |  |  |  |  |        |
| 52                 | 11711311   | 10710718   | 110113117  | 12217132   | 135137135  | 132127122  | 117113109  |  |  |  |  |  |        |
| 54                 | 119114110  | 108106107  | 107109113  | 1171218  | 133135136  | 13312914   | 118114110  |  |  |  |  |  |        |
| 56                 | 12116111   | 108106105  | 106108110  | 11411915   | 19133134   | 132129125  | 120115111  |  |  |  |  |  |        |
| 58                 | 118113108  | 1610312  | 103104106  | 110115120  | 12512819   | 129126122  | 118112108  |  |  |  |  |  |        |
| 60                 | 111107103  | 109796   | 9597100  | 103107111  | 115118119  | 120118114  | 111107103  |  |  |  |  |  |        |
| 62                 | 96989  | 868584   | 858688   | 99598  | 101103105  | 10410299   | 959289   |  |  |  |  |  |        |
| 64                 | 767371   | 696868   | 6877   | 757780   | 838484   | 838179   | 76737  |  |  |  |  |  |        |
| 66                 | 55535  | 505051   | 55355  | 57606  | 626262   | 605956   | 555351   |  |  |  |  |  |        |
| 68                 | 373635   | 343637   | 383941   | 434444   | 454443   | 424039   | 373635   |  |  |  |  |  |        |
| 70                 | 5524   | 5728   | 29303  | 333333   | 33330  | 292726   | 252524   |  |  |  |  |  |        |
| 72                 | 2234   | 2578   | 293030   | 303029   | 28725  | 432  | 2224   |  |  |  |  |  |        |
| 74                 | 9303   | 343536   | 363737   | 363534   | 33130  | 29929  | 303133   |  |  |  |  |  |        |
| 76                 | 454648   | 51525  | 55550  | 484645   | 43424  | 414244   | 454648   |  |  |  |  |  |        |
| 78                 | 656871   | 77373  | 77169  | 66646  | 65958  | 606163   | 656871   |  |  |  |  |  |        |
| 80                 | 868992   | 949393   | 918885   | 827977   | 767577   | 788184   | 869092   |  |  |  |  |  |        |

Appli d O t t +9 Th it i this T bl i q l t ooooo

# SATELLITE III

## Tables of the Phenomena

LVI

Reduction to Middle

Argument O

| 1               | 2                  | 3    | 4               | 5                  |
|-----------------|--------------------|------|-----------------|--------------------|
| Ecl., Oc.       | $\Delta_{0^d 0^m}$ | O    | Sh., Tr.        | $\Delta_{0^d 0^m}$ |
| d<br>- 0'000360 | - 27,5             | 0'00 | d<br>- 0'000440 | - 36,0             |
| 470             | 27,5               | '04  | 584             | 35,9               |
| 580             | 27,3               | '08  | 727             | 35,6               |
| 688             | 26,8               | '12  | 869             | 35,3               |
| 794             | 26,3               | '16  | 1009            | 34,6               |
| 898             | 25,8               | '20  | 1146            | 33,8               |
| - 0'001000      | - 25,1             | 0'24 | - 0'001279      | - 32,8             |
| 1099            | 24,4               | '28  | 1408            | 31,6               |
| 1195            | 23,4               | '32  | 1532            | 30,4               |
| 1286            | 21,8               | '36  | 1651            | 29,1               |
| 1373            | 21,0               | '40  | 1765            | 27,5               |
| - 0'001454      | - 19,6             | 0'44 | - 0'001871      | - 25,6             |
| 1530            | 18,3               | '48  | 1970            | 23,9               |
| 1600            | 16,8               | '52  | 2062            | 22,0               |
| 1664            | 15,3               | '56  | 2146            | 19,9               |
| 1722            | 13,6               | '60  | 2221            | 17,8               |
| - 0'001773      | - 11,9             | 0'64 | - 0'002288      | - 15,6             |
| 1817            | 10,1               | '68  | 2346            | 13,3               |
| 1854            | 8,4                | '72  | 2394            | 10,9               |
| 1884            | 6,5                | '76  | 2433            | 8,5                |
| 1906            | 4,5                | '80  | 2462            | 6,0                |
| - 0'001920      | - 2,6              | 0'84 | - 0'002481      | - 3,4              |
| 1927            | - 0,6              | '88  | 2489            | - 0,9              |
| 1925            | + 1,4              | '92  | 2488            | + 1,6              |
| 1916            | 3,1                | '96  | 2476            | 4,1                |
| 1900            | 5,0                | 1'00 | 2455            | 6,6                |
| - 0'001876      | + 7,0              | 1'04 | - 0'002423      | + 9,1              |
| 1844            | 8,9                | '08  | 2382            | 11,5               |
| 1805            | 10,6               | '12  | 2331            | 13,9               |
| 1759            | 12,3               | '16  | 2271            | 16,1               |
| 1707            | 14,0               | '20  | 2202            | 18,4               |
| - 0'001647      | + 15,8             | 1'24 | - 0'002124      | + 20,6             |
| 1581            | 17,3               | '28  | 2037            | 22,6               |
| 1509            | 18,8               | '32  | 1943            | 24,4               |
| 1431            | 20,1               | '36  | 1842            | 26,3               |
| 1348            | 21,3               | '40  | 1733            | 28,0               |
| - 0'001261      | + 22,4             | 1'44 | - 0'001618      | + 29,4             |
| 1169            | 23,6               | '48  | 1498            | 30,8               |
| 1072            | 24,6               | '52  | 1372            | 32,1               |
| 972             | 25,3               | '56  | 1241            | 33,1               |
| 870             | 25,9               | '60  | 1107            | 34,0               |
| - 0'000765      | + 26,6             | 1'64 | - 0'000969      | + 34,8             |
| 657             | 27,1               | '68  | 829             | 35,4               |
| 548             | 27,3               | '72  | 686             | 35,8               |
| 439             | 27,4               | '76  | 543             | 35,9               |
| 329             | 27,5               | '80  | 399             | 36,0               |
| - 0'000219      | + 27,4             | 1'84 | - 0'000255      | + 35,9             |
| 110             | 27,1               | '88  | - 112           | 35,5               |
| - 2             | 26,9               | '92  | + 29            | 35,0               |
| + 105           | 26,4               | '96  | 168             | 34,4               |
| + 0'000209      | + 25,6             | 2'00 | + 0'000304      | + 33,5             |

| 1               | 2                  | 3    | 4               | 5                  |
|-----------------|--------------------|------|-----------------|--------------------|
| Ecl., Oc.       | $\Delta_{0^d 0^m}$ | O    | Sh., Tr.        | $\Delta_{0^d 0^m}$ |
| d<br>+ 0'000209 | + 25,6             | 2'00 | d<br>+ 0'000304 | + 33,5             |
| 310             | 24,8               | '04  | 436             | 32,5               |
| 407             | 23,9               | '08  | 564             | 31,4               |
| 501             | 23,0               | '12  | 687             | 30,0               |
| 591             | 21,9               | '16  | 804             | 28,6               |
| 676             | 20,6               | '20  | 916             | 27,0               |
| + 0'000756      | + 19,4             | 2'24 | + 0'001020      | + 25,3             |
| 831             | 17,9               | '28  | 1118            | 23,5               |
| 899             | 16,3               | '32  | 1208            | 21,4               |
| 961             | 14,8               | '36  | 1289            | 19,3               |
| 1017            | 13,3               | '40  | 1362            | 17,1               |
| + 0'001067      | + 11,5             | 2'44 | + 0'001426      | + 14,9             |
| 1109            | 9,5                | '48  | 1481            | 12,5               |
| 1143            | 7,6                | '52  | 1526            | 10,1               |
| 1170            | 5,9                | '56  | 1562            | 7,8                |
| 1190            | 4,1                | '60  | 1588            | 5,3                |
| + 0'001203      | + 2,1              | 2'64 | + 0'001604      | + 2,8              |
| 1207            | + 0,1              | '68  | 1610            | + 0,3              |
| 1204            | - 1,8              | '72  | 1606            | - 2,4              |
| 1193            | 3,8                | '76  | 1591            | 4,9                |
| 1174            | 5,6                | '80  | 1567            | 7,4                |
| + 0'001148      | - 7,5              | 2'84 | + 0'001532      | - 9,9              |
| 1114            | 9,4                | '88  | 1488            | 12,1               |
| 1073            | 11,1               | '92  | 1435            | 14,5               |
| 1025            | 12,8               | '96  | 1372            | 16,9               |
| 971             | 14,5               | 3'00 | 1300            | 19,0               |
| + 0'000909      | - 16,3             | 3'04 | + 0'001220      | - 21,1             |
| 841             | 17,8               | '08  | 1131            | 23,1               |
| 767             | 19,1               | '12  | 1035            | 25,0               |
| 688             | 20,4               | '16  | 931             | 26,8               |
| 604             | 21,6               | '20  | 821             | 28,4               |
| + 0'000515      | - 22,8             | 3'24 | + 0'000704      | - 29,9             |
| 422             | 23,9               | '28  | 582             | 31,1               |
| 324             | 24,9               | '32  | 455             | 32,4               |
| 223             | 25,5               | '36  | 323             | 33,4               |
| 120             | 26,1               | '40  | 188             | 34,1               |
| + 0'000014      | - 26,8             | 3'44 | + 0'000050      | - 34,9             |
| - 94            | 27,1               | '48  | - 91            | 35,5               |
| 203             | 27,3               | '52  | 234             | 35,9               |
| 312             | 27,4               | '56  | 378             | 36,0               |
| 422             | 27,4               | '60  | 522             | 35,9               |
| - 0'000532      | - 27,4             | 3'64 | - 0'000665      | - 35,8             |
| 641             | 27,1               | '68  | 808             | 35,4               |
| 749             | 26,6               | '72  | 948             | 34,9               |
| 854             | 26,0               | '76  | 1087            | 34,3               |
| 957             | 25,5               | '80  | 1222            | 33,3               |
| - 0'001058      | - 24,6             | 3'84 | - 0'001353      | - 32,1             |
| 1154            | 23,6               | '88  | 1479            | 31,0               |
| 1247            | 22,8               | '92  | 1601            | 29,8               |
| 1336            | 21,5               | '96  | 1717            | 28,1               |
| - 0'001419      | - 20,1             | 4'00 | - 0'001826      | - 26,4             |

Applied Constant :  $-0^d 0^m 0^s 400$ .

corrected by the Equations of Tables LVII-LXIV.  
Tables XXXIII-XXXVI.

This Table includes a constant portion of the Equation of Light.

The whole must be corrected by adding to it its product by the Variation, as drawn from  
For Shadows and Transits it must also be corrected for Jupiter's Phase by Table LXV.

The Entry must be

# SATELLITE III

## Tables of the Phenomena

LVI continued

Reductions to Middle

Argument O

| Ecl Oc                    | $\Delta$<br>o o | 3<br>O      | 4<br>Sl T | 5<br>$\Delta$<br>o or |
|---------------------------|-----------------|-------------|-----------|-----------------------|
| <sup>d</sup><br>-0 001419 | - 0 1           | <b>4 00</b> | -0 001826 | -26 4                 |
| 1497                      | 18 9            | <b>04</b>   | 19 8      | 4 6                   |
| 1570                      | 17 4            | <b>08</b>   | 023       | 8                     |
| 1636                      | 15 9            | <b>12</b>   | 110       | 0 8                   |
| 1697                      | 14 4            | <b>16</b>   | 2189      | 18 8                  |
| 1751                      | 1 6             | <b>20</b>   | 2 60      | 16 5                  |
| -0 0 1798                 | -10 9           | <b>4 24</b> | -0 0 3 1  | -14 1                 |
| 1838                      | 9 1             | <b>28</b>   | 2373      | 11 9                  |
| 1871                      | 7 3             | <b>32</b>   | 2416      | 9 5                   |
| 1896                      | 5 4             | <b>36</b>   | 449       | 7 1                   |
| 1914                      | 3 5             | <b>40</b>   | 2473      | 4                     |
| -0 0019 4                 | - 1 5           | <b>4 44</b> | -0 002486 | - 1 9                 |
| 19 6                      | + 5             | <b>48</b>   | 2488      | + 6                   |
| 19                        | 2 4             | <b>52</b>   | 481       | 3                     |
| 19 7                      | 4 3             | <b>56</b>   | 464       | 5 5                   |
| 1886                      | 6 1             | <b>60</b>   | 2437      | 8 0                   |
| -0 001858                 | + 8 0           | <b>4 64</b> | -0 002400 | +10 5                 |
| 182                       | 9 9             | <b>68</b>   | 2353      | 1 9                   |
| 1779                      | 11 6            | <b>72</b>   | 2297      | 15 1                  |
| 17 9                      | 13 3            | <b>76</b>   | 2 32      | 17 4                  |
| 1673                      | 14 9            | <b>80</b>   | 158       | 19 6                  |
| -0 001610                 | +16 6           | <b>4 84</b> | -0 00 75  | +21 8                 |
| 1540                      | 18 1            | <b>88</b>   | 1984      | 3 6                   |
| 1465                      | 19 5            | <b>92</b>   | 1886      | 5 5                   |
| 1384                      | 0 8             | <b>96</b>   | 1780      | 27 3                  |
| 1299                      | 1 9             | <b>5 00</b> | 1668      | 8 8                   |
| -0 001 09                 | + 3 1           | <b>5 04</b> | -0 001550 | +30 3                 |
| 1114                      | 4 3             | <b>08</b>   | 1426      | 31 5                  |
| 1015                      | 5 0             | <b>12</b>   | 1298      | 32 6                  |
| 914                       | 25 6            | <b>16</b>   | 1165      | 33 6                  |
| 810                       | 6 3             | <b>20</b>   | 10 9      | 34 4                  |
| -0 000704                 | + 6 9           | <b>5 24</b> | -0 000890 | +35 1                 |
| 595                       | 7 3             | <b>28</b>   | 748       | 35 6                  |
| 486                       | 7 3             | <b>32</b>   | 6 5       | 35 9                  |
| 377                       | 7 4             | <b>36</b>   | 461       | 36 0                  |
| 267                       | 27 5            | <b>40</b>   | 317       | 35 9                  |
| -0 000157                 | + 7 3           | <b>5 44</b> | -0 000174 | +35 6                 |
| - 49                      | 27 0            | <b>48</b>   | - 3       | 35 3                  |
| + 59                      | 26 6            | <b>52</b>   | + 108     | 34 6                  |
| 164                       | 5 9             | <b>56</b>   | 45        | 33 9                  |
| 66                        | 25 1            | <b>60</b>   | 379       | 33 0                  |
| +0 000365                 | +24 4           | <b>5 64</b> | +0 0005 9 | +31 9                 |
| 461                       | 3 5             | <b>68</b>   | 634       | 30 5                  |
| 553                       | 3               | <b>72</b>   | 753       | 9 1                   |
| 639                       | 1 0             | <b>76</b>   | 867       | 7 8                   |
| 721                       | 0               | <b>80</b>   | 975       | 26 1                  |
| +0 0799                   | +18 6           | <b>5 84</b> | +0 001076 | +24 4                 |
| 870                       | 16 9            | <b>88</b>   | 1170      | 2 3                   |
| 934                       | 15 4            | <b>92</b>   | 1254      | 0 0                   |
| 993                       | 13 9            | <b>96</b>   | 1330      | 18 0                  |
| +0 001045                 | +1 1            | <b>6 00</b> | +0 0 1398 | +15 9                 |

| Ecl Oc    | $\Delta$<br>o <sup>2</sup> or | 3<br>O                      | 4<br>Sh T | 5<br>$\Delta$<br>o or |
|-----------|-------------------------------|-----------------------------|-----------|-----------------------|
| +0 001045 | +12 1                         | <sup>d</sup><br><b>6 00</b> | +0 001398 | +15 9                 |
| 109       | 10 4                          | <b>04</b>                   | 1457      | 13 6                  |
| 11 8      | 8 5                           | <b>08</b>                   | 1507      | 11 3                  |
| 1158      | 6 6                           | <b>12</b>                   | 1547      | 8 8                   |
| 1181      | 4 9                           | <b>16</b>                   | 1577      | 6 3                   |
| 1197      | 3 0                           | <b>20</b>                   | 1597      | 3 8                   |
| +0 012 5  | + 1 0                         | <b>6 24</b>                 | +0 001607 | + 1 4                 |
| 1 5       | - 1 0                         | <b>28</b>                   | 1608      | - 1 3                 |
| 1197      | 2 9                           | <b>32</b>                   | 1597      | 3 9                   |
| 1182      | 4 8                           | <b>36</b>                   | 1577      | 6 3                   |
| 1159      | 6 6                           | <b>40</b>                   | 1547      | 8 8                   |
| +0 0011 9 | - 8 5                         | <b>6 44</b>                 | +0 001507 | -11 1                 |
| 1091      | 10 4                          | <b>48</b>                   | 1458      | 13 5                  |
| 1046      | 12 1                          | <b>52</b>                   | 1399      | 15 9                  |
| 994       | 13 8                          | <b>56</b>                   | 1331      | 18 1                  |
| 936       | 15 5                          | <b>60</b>                   | 1254      | 0 3                   |
| +0 000870 | -17 1                         | <b>6 64</b>                 | +0 001169 | -22 3                 |
| 799       | 18 5                          | <b>68</b>                   | 1076      | 24 1                  |
| 722       | 19 9                          | <b>72</b>                   | 976       | 25 9                  |
| 640       | 21 1                          | <b>76</b>                   | 869       | 27 6                  |
| 553       | 2 3                           | <b>80</b>                   | 755       | 9 3                   |
| +0 000462 | - 3 4                         | <b>6 84</b>                 | +0 000635 | -30 6                 |
| 366       | 24 4                          | <b>88</b>                   | 510       | 31 9                  |
| 67        | 5 3                           | <b>92</b>                   | 380       | 33 0                  |
| 164       | 6 0                           | <b>96</b>                   | 246       | 33 9                  |
| + 59      | 26 4                          | <b>7 00</b>                 | + 109     | 34 5                  |
| -0 000047 | -26 9                         | <b>7 04</b>                 | -0 000030 | -35 1                 |
| 156       | 7 3                           | <b>08</b>                   | 172       | 35 8                  |
| 65        | 27 3                          | <b>12</b>                   | 316       | 36 0                  |
| 374       | 27 5                          | <b>16</b>                   | 460       | 35 9                  |
| 485       | 27 5                          | <b>20</b>                   | 603       | 35 8                  |
| -0 000594 | -27 1                         | <b>7 24</b>                 | -0 000746 | -35 6                 |
| 70        | 26 9                          | <b>28</b>                   | 888       | 35 1                  |
| 809       | 26 4                          | <b>32</b>                   | 1027      | 34 4                  |
| 913       | 5 6                           | <b>36</b>                   | 1163      | 33 6                  |
| 1014      | 25 0                          | <b>40</b>                   | 1296      | 32 8                  |
| -0 001113 | -24 1                         | <b>7 44</b>                 | -0 001425 | -31 5                 |
| 1207      | 23 1                          | <b>48</b>                   | 1548      | 30 3                  |
| 1298      | 22 3                          | <b>52</b>                   | 1667      | 28 9                  |
| 1385      | 21                            | <b>56</b>                   | 1779      | 27 4                  |
| 1466      | 19 5                          | <b>60</b>                   | 1886      | 5 8                   |
| -0 001541 | -18 0                         | <b>7 64</b>                 | -0 001985 | -23 8                 |
| 1610      | 16 6                          | <b>68</b>                   | 2076      | 21 6                  |
| 1674      | 15 1                          | <b>72</b>                   | 2158      | 19 6                  |
| 1731      | 13 4                          | <b>76</b>                   | 33        | 17 6                  |
| 1781      | 11 6                          | <b>80</b>                   | 2299      | 15 1                  |
| -0 001824 | - 9 9                         | <b>7 84</b>                 | -0 002354 | -12 8                 |
| 1860      | 8 1                           | <b>88</b>                   | 2401      | 10 6                  |
| 1889      | 6 3                           | <b>92</b>                   | 2439      | 8 0                   |
| 1910      | 4 3                           | <b>96</b>                   | 2465      | 5 1                   |
| -0 0019 3 | - 3                           | <b>8 00</b>                 | -0 002480 | - 2 4                 |

Appl dC t t 004  
t db tl Eq t  
T bl XXXIII XXXVI

Th T bl i l des  
f T bl LVII LXIV  
T Sh dw dT

t tp rti fth Eq t fLight  
Th wh l m tb t d by ddi gto itit p d t by th V i ti  
t itm t l b t d f J pit Ph by T bl LXV

Th E t y m t b  
dr w fr m

# SATELLITE III

## Tables of the Phenomena

### Equations of the Reduction

LVII

| 1   | 2              |
|-----|----------------|
| P   | E., O., S., T. |
| d   | d              |
| 0.0 | 0.000020       |
| 1   | 24             |
| 2   | 27             |
| 3   | 30             |
| 4   | 32             |
| 5   | 35             |
| 0.6 | 0.000037       |
| 7   | 38             |
| 8   | 39             |
| 9   | 39             |
| 1.0 | 39             |
| 1.1 | 0.000038       |
| 2   | 37             |
| 3   | 35             |
| 4   | 32             |
| 5   | 29             |
| 1.6 | 0.000026       |
| 7   | 23             |
| 8   | 19             |
| 9   | 16             |
| 2.0 | 13             |
| 2.1 | 0.000010       |
| 2   | 7              |
| 3   | 5              |
| 4   | 3              |
| 5   | 2              |
| 2.6 | 0.000001       |
| 7   | 1              |
| 8   | 1              |
| 9   | 2              |
| 3.0 | 3              |
| 3.1 | 0.000005       |
| 2   | 8              |
| 3   | 11             |
| 4   | 14             |
| 5   | 17             |
| 3.6 | 0.000021       |
| 7   | 24             |
| 8   | 27             |
| 9   | 30             |
| 4.0 | 0.000033       |

Constant: +0.000020.

LVIII

| 1         | 2                 | 3    | 4        | 5                 |
|-----------|-------------------|------|----------|-------------------|
| Ecl., Oc. | $\Delta$<br>0d.01 | Q    | Sh., Tr. | $\Delta$<br>0d.01 |
| d         | d                 | d    | d        | d                 |
| 0.000290  | -3,5              | 0.00 | 0.000290 | -4,0              |
| 276       | 3,5               | 04   | 274      | 4,0               |
| 262       | 3,5               | 08   | 258      | 4,0               |
| 248       | 3,4               | 12   | 242      | 3,9               |
| 235       | 3,4               | 16   | 227      | 3,9               |
| 221       | 3,4               | 20   | 211      | 3,9               |
| 0.000208  | -3,3              | 0.24 | 0.000196 | -3,6              |
| 195       | 3,1               | 28   | 182      | 3,5               |
| 183       | 2,9               | 32   | 168      | 3,4               |
| 172       | 2,8               | 36   | 155      | 3,3               |
| 161       | 2,6               | 40   | 142      | 3,1               |
| 0.000151  | -2,5              | 0.44 | 0.000130 | -2,9              |
| 141       | 2,4               | 48   | 119      | 2,6               |
| 132       | 2,3               | 52   | 109      | 2,4               |
| 123       | 2,0               | 56   | 100      | 2,3               |
| 116       | 1,8               | 60   | 91       | 2,0               |
| 0.000109  | -1,5              | 0.64 | 0.000084 | -1,8              |
| 104       | 1,3               | 68   | 77       | 1,5               |
| 99        | 1,1               | 72   | 72       | 1,3               |
| 95        | 0,8               | 76   | 67       | 0,9               |
| 93        | 0,5               | 80   | 65       | 0,6               |
| 0.000091  | -0,4              | 0.84 | 0.000062 | -0,5              |
| 90        | -0,1              | 88   | 61       | 0,0               |
| 90        | +0,1              | 92   | 62       | +0,3              |
| 91        | 0,4               | 96   | 63       | 0,5               |
| 93        | 0,6               | 1.00 | 66       | 0,8               |
| 0.000096  | +0,9              | 1.04 | 0.000069 | +1,0              |
| 100       | 1,1               | 08   | 74       | 1,4               |
| 105       | 1,4               | 12   | 80       | 1,5               |
| 111       | 1,6               | 16   | 86       | 1,8               |
| 118       | 1,8               | 20   | 94       | 2,0               |
| 0.000125  | +2,0              | 1.24 | 0.000102 | +2,3              |
| 134       | 2,3               | 28   | 112      | 2,6               |
| 143       | 2,4               | 32   | 123      | 2,8               |
| 153       | 2,6               | 36   | 134      | 2,9               |
| 164       | 2,8               | 40   | 146      | 3,0               |
| 0.000175  | +2,8              | 1.44 | 0.000158 | +3,2              |
| 186       | 3,0               | 48   | 172      | 3,4               |
| 199       | 3,2               | 52   | 185      | 3,5               |
| 212       | 3,3               | 56   | 200      | 3,8               |
| 225       | 3,3               | 60   | 215      | 3,9               |
| 0.000238  | +3,4              | 1.64 | 0.000231 | +3,9              |
| 252       | 3,5               | 68   | 246      | 4,0               |
| 266       | 3,5               | 72   | 263      | 4,0               |
| 280       | 3,5               | 76   | 278      | 3,9               |
| 294       | 3,5               | 80   | 294      | 4,1               |
| 0.000308  | +3,5              | 1.84 | 0.000311 | +4,0              |
| 322       | 3,4               | 88   | 326      | 3,9               |
| 335       | 3,4               | 92   | 342      | 4,0               |
| 349       | 3,4               | 96   | 358      | 3,9               |
| 0.000362  | +3,3              | 2.00 | 0.000373 | +3,6              |
| 375       | 3,2               | 04   | 375      | 3,6               |
| 388       | 3,0               | 08   | 388      | 3,5               |
| 399       | 2,9               | 12   | 399      | 3,3               |
| 411       | 2,9               | 16   | 411      | 3,1               |
| 422       | 2,5               | 20   | 422      | 3,0               |
| 0.000431  | +2,4              | 2.24 | 0.000452 | +2,9              |
| 441       | 2,4               | 28   | 463      | 2,6               |
| 450       | 2,1               | 32   | 473      | 2,4               |
| 458       | 1,9               | 36   | 482      | 2,1               |
| 465       | 1,8               | 40   | 490      | 1,9               |
| 0.000472  | +1,5              | 2.44 | 0.000497 | +1,6              |
| 477       | 1,1               | 48   | 503      | 1,4               |
| 481       | 1,0               | 52   | 508      | 1,3               |
| 485       | 0,8               | 56   | 513      | 0,9               |
| 487       | 0,4               | 60   | 515      | 0,5               |
| 0.000488  | +0,2              | 2.64 | 0.000517 | +0,5              |
| 489       | +0,1              | 68   | 519      | 0,0               |
| 489       | -0,2              | 72   | 517      | -0,5              |
| 487       | 0,5               | 76   | 515      | 0,5               |
| 485       | 0,8               | 80   | 513      | 0,8               |
| 0.000481  | -0,9              | 2.84 | 0.000509 | -1,1              |
| 478       | 1,0               | 88   | 504      | 1,4               |
| 473       | 1,5               | 92   | 498      | 1,6               |
| 466       | 1,6               | 96   | 491      | 1,9               |
| 460       | 1,8               | 3.00 | 483      | 2,1               |
| 0.000452  | -2,1              | 3.04 | 0.000474 | -2,3              |
| 443       | 2,4               | 08   | 465      | 2,6               |
| 433       | 2,5               | 12   | 453      | 2,9               |
| 423       | 2,6               | 16   | 442      | 2,9               |
| 412       | 2,8               | 20   | 430      | 3,1               |
| 0.000401  | -2,9              | 3.24 | 0.000417 | -3,4              |
| 389       | 3,0               | 28   | 403      | 3,5               |
| 377       | 3,2               | 32   | 389      | 3,5               |
| 363       | 3,3               | 36   | 375      | 3,6               |
| 351       | 3,3               | 40   | 360      | 3,9               |
| 0.000337  | -3,4              | 3.44 | 0.000344 | -4,0              |
| 324       | 3,4               | 48   | 328      | 4,0               |
| 310       | 3,5               | 52   | 312      | 3,9               |
| 296       | 3,5               | 56   | 297      | 3,9               |
| 282       | 3,5               | 60   | 281      | 4,1               |
| 0.000268  | -3,5              | 3.64 | 0.000264 | -4,0              |
| 254       | 3,5               | 68   | 249      | 3,9               |
| 240       | 3,4               | 72   | 233      | 3,9               |
| 227       | 3,3               | 76   | 218      | 3,9               |
| 214       | 3,4               | 80   | 202      | 3,8               |
| 0.000200  | -3,3              | 3.84 | 0.000188 | -3,5              |
| 188       | 3,0               | 88   | 174      | 3,5               |
| 176       | 2,9               | 92   | 160      | 3,3               |
| 165       | 2,6               | 96   | 148      | 3,0               |
| 0.000155  | -2,4              | 4.00 | 0.000136 | -3,0              |

Applied Constant: +0.000290.

# SATELLITE III

## Tables of the Phenomena

### Equations of the Reduction

LIX

| Ecl Oc   | R  | 3<br>Sh Tr |
|----------|----|------------|
| 00005    | 00 | 0 000050   |
| 43       | 1  | 42         |
| 36       | 2  | 35         |
| 30       | 3  | 8          |
| 5        | 4  | 1          |
| 0        | 5  | 16         |
| 0 0 16   | 06 | 0 000011   |
| 13       | 7  | 8          |
| 11       | 8  | 6          |
| 11       | 9  | 5          |
| 11       | 10 | 6          |
| 0 000 13 | 11 | 0 00 9     |
| 16       | 2  | 1          |
| 21       | 3  | 16         |
| 26       | 4  | 2          |
| 31       | 5  | 8          |
| 0 000037 | 16 | 0 000035   |
| 44       | 7  | 43         |
| 51       | 8  | 51         |
| 58       | 9  | 59         |
| 0 00 064 | 20 | 0 000066   |

Appli dC t t + 005

LX

| S  | E O S T  | S  | E O S T       |
|----|----------|----|---------------|
| 00 | 00001    | 40 | d<br>0 000004 |
| 2  | 7        | 2  | 3             |
| 4  | 5        | 4  |               |
| 6  | 3        | 6  | 2             |
| 8  | 2        | 8  | 3             |
| 10 | 2        | 50 | 4             |
| 12 | 0 000003 | 52 | 0 000007      |
| 4  | 4        | 4  | 10            |
| 6  | 7        | 6  | 13            |
| 8  | 10       | 8  | 16            |
| 20 | 13       | 60 | 17            |
| 22 | 0 000016 | 62 | 0 000018      |
| 4  | 17       | 4  | 18            |
| 6  | 18       | 6  | 17            |
| 8  | 18       | 8  | 15            |
| 30 | 17       | 70 | 13            |
| 32 | 0 000015 | 72 | 0 000010      |
| 4  | 1        | 4  | 7             |
| 6  | 9        | 6  | 4             |
| 8  | 6        | 8  | 3             |
| 40 | 0 000004 | 80 | 0 0 0002      |

Appli dC t t +

LXI

| D  | E O S T       | D  | E O S T       |
|----|---------------|----|---------------|
| 00 | d<br>0 000010 | 40 | d<br>0 000007 |
| 2  | 1             | 2  | 6             |
| 4  | 13            | 4  | 5             |
| 6  | 14            | 6  | 4             |
| 8  | 15            | 8  | 3             |
| 10 | 16            | 50 |               |
| 12 | 0 000017      | 52 | 0 000002      |
| 4  | 18            | 4  | 2             |
| 6  | 18            | 6  |               |
| 8  | 18            | 8  | 2             |
| 20 | 18            | 60 | 3             |
| 22 | 0 00 18       | 62 | 0 000004      |
| 4  | 17            | 4  | 5             |
| 6  | 16            | 6  | 6             |
| 8  | 15            | 8  | 7             |
| 30 | 14            | 70 | 8             |
| 32 | 0 000 13      | 72 | 0 000010      |
| 4  | 1             | 4  | 12            |
| 6  | 10            | 6  | 13            |
| 8  | 8             | 8  | 14            |
| 40 | 0 000007      | 80 | 0 000015      |

Appli dC t t + 000

LXII

| Ecl Oc        | N    | 3<br>Sh Tr    |
|---------------|------|---------------|
| d<br>0 000004 | 1850 | d<br>0 000036 |
|               | 55   | 38            |
| 1             | 60   | 39            |
| 1             | 65   | 39            |
|               | 70   | 38            |
| 3             | 75   | 37            |
| 0 000005      | 1880 | 0 000035      |
| 8             | 85   | 32            |
| 11            | 90   | 29            |
| 15            | 95   | 25            |
| 18            | 1900 | 22            |
| 0 000022      | 1905 | 0 000018      |
| 26            | 10   | 14            |
| 29            | 15   | 11            |
| 32            | 20   | 8             |
| 0 000033      | 1925 | 0 000007      |

Appli dC t t +

| Ecl Oc        | N    | 3<br>Sh Tr    |
|---------------|------|---------------|
| d<br>0 000033 | 1925 | d<br>0 000007 |
| 35            | 30   | 5             |
| 35            | 35   | 5             |
| 35            | 40   | 5             |
| 34            | 45   | 6             |
| 32            | 50   | 8             |
| 0 000029      | 1955 | 0 000011      |
| 6             | 60   | 14            |
| 3             | 65   | 17            |
| 19            | 70   | 21            |
| 16            | 75   | 24            |
| 0 000013      | 1980 | 0 00 027      |
| 10            | 85   | 30            |
| 7             | 90   | 33            |
| 6             | 95   | 34            |
| 0 000005      | 2000 | 0 000035      |

# SATELLITE III

## Tables of the Phenomena

LXIII

Equation of the Reduction

Occultations

| O<br>γ | 0 <sup>d.0</sup> 0 <sup>d.2</sup> 0 <sup>d.4</sup> |     |   | 0 <sup>d.6</sup> 0 <sup>d.8</sup> 1 <sup>d.0</sup> |   |     | 1 <sup>d.2</sup> 1 <sup>d.4</sup> 1 <sup>d.6</sup> |     |   | 1 <sup>d.8</sup> 2 <sup>d.0</sup> 2 <sup>d.2</sup> |   |     | 2 <sup>d.4</sup> 2 <sup>d.6</sup> 2 <sup>d.8</sup> |     |   | 3 <sup>d.0</sup> 3 <sup>d.2</sup> 3 <sup>d.4</sup> |   |      | 3 <sup>d.6</sup> 3 <sup>d.8</sup> 4 <sup>d.0</sup> |     |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |   |
|--------|--|-----|---|--|---|-----|--|-----|---|--|---|-----|--|-----|---|--|---|------|--|-----|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|---|
|        |  |     |   |  |   |     |  |     |   |  |   |     |  |     |   |  |   |      |  |     |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |   |
| d<br>0 | +  | 9   | + | 8  | + | 8   | +  | 7   | + | 6  | + | 5   | +  | 4   | + | 3  | + | 1    | 0  | -   | 1   | - | 3   | - | 4   | - | 6   | - | 6   | - | 7   | - | 8   | - | 8   | - | 9   | - | 8   | - | 8 |
| 10     | +  | 54  | + | 53   | + | 50  | +  | 46  | + | 41   | + | 34  | +  | 26  | + | 18   | + | 8    | -1   | -10 | -19 | - | 27  | - | 35  | - | 42  | - | 47  | - | 51  | - | 53  | - | 54  | - | 53  | - | 50  |   |   |
| 20     | +  | 97  | + | 95   | + | 91  | +  | 83  | + | 74   | + | 62  | +  | 48  | + | 32   | + | 16   | -1   | -18 | -34 | - | 49  | - | 63  | - | 75  | - | 84  | - | 92  | - | 96  | - | 97  | - | 95  | - | 90  |   |   |
| 30     | +  | 137 | + | 135  | + | 129 | +  | 119 | + | 105  | + | 88  | +  | 68  | + | 46   | + | 23   | -2   | -26 | -48 | - | 71  | - | 89  | - | 107 | - | 121 | - | 130 | - | 136 | - | 137 | - | 135 | - | 129 |   |   |
| 40     | +  | 174 | + | 172  | + | 164 | +  | 150 | + | 132  | + | 111 | +  | 86  | + | 58   | + | 29   | -2   | -33 | -61 | - | 89  | - | 113 | - | 135 | - | 152 | - | 165 | - | 172 | - | 174 | - | 171 | - | 162 |   |   |
| 50     | +  | 206 | + | 202  | + | 193 | +  | 177 | + | 156  | + | 132 | +  | 101 | + | 68   | + | 35   | -2   | -39 | -72 | - | 105 | - | 134 | - | 159 | - | 180 | - | 195 | - | 203 | - | 206 | - | 202 | - | 191 |   |   |
| 60     | +  | 230 | + | 227  | + | 217 | +  | 200 | + | 176  | + | 148 | +  | 113 | + | 76   | + | 39   | -3   | -43 | -81 | - | 118 | - | 150 | - | 179 | - | 202 | - | 219 | - | 228 | - | 230 | - | 226 | - | 215 |   |   |
| 70     | +  | 249 | + | 245  | + | 234 | +  | 215 | + | 190  | + | 159 | +  | 122 | + | 83   | + | 42   | -3   | -46 | -88 | - | 127 | - | 162 | - | 193 | - | 218 | - | 236 | - | 246 | - | 249 | - | 245 | - | 232 |   |   |
| 80     | +  | 261 | + | 257  | + | 245 | +  | 225 | + | 199  | + | 167 | +  | 129 | + | 87   | + | 44   | -3   | -48 | -92 | - | 134 | - | 170 | - | 203 | - | 228 | - | 247 | - | 258 | - | 261 | - | 256 | - | 243 |   |   |
| 90     | +  | 264 | + | 260  | + | 248 | +  | 228 | + | 201  | + | 169 | +  | 130 | + | 88   | + | 44   | -3   | -49 | -93 | - | 135 | - | 172 | - | 205 | - | 231 | - | 250 | - | 261 | - | 264 | - | 259 | - | 246 |   |   |
| 100    | +  | 260 | + | 256  | + | 243 | +  | 225 | + | 197  | + | 166 | +  | 128 | + | 86   | + | 43   | -3   | -48 | -91 | - | 132 | - | 169 | - | 201 | - | 228 | - | 246 | - | 257 | - | 260 | - | 255 | - | 242 |   |   |
| 110    | +  | 248 | + | 244  | + | 233 | +  | 214 | + | 189  | + | 159 | +  | 122 | + | 82   | + | 41   | -3   | -46 | -87 | - | 127 | - | 162 | - | 192 | - | 217 | - | 235 | - | 245 | - | 248 | - | 243 | - | 231 |   |   |
| 120    | +  | 229 | + | 225  | + | 215 | +  | 197 | + | 174  | + | 146 | +  | 113 | + | 77   | + | 38   | -3   | -42 | -81 | - | 117 | - | 149 | - | 177 | - | 197 | - | 217 | - | 226 | - | 229 | - | 224 | - | 213 |   |   |
| 130    | +  | 202 | + | 199  | + | 190 | +  | 175 | + | 155  | + | 129 | +  | 100 | + | 68   | + | 33   | -2   | -37 | -72 | - | 103 | - | 132 | - | 158 | - | 175 | - | 192 | - | 200 | - | 202 | - | 199 | - | 189 |   |   |
| 140    | +  | 170 | + | 167  | + | 160 | +  | 147 | + | 130  | + | 109 | +  | 84  | + | 57   | + | 28   | -2   | -31 | -60 | - | 87  | - | 111 | - | 132 | - | 149 | - | 161 | - | 168 | - | 170 | - | 167 | - | 158 |   |   |
| 150    | +  | 134 | + | 132  | + | 126 | +  | 115 | + | 102  | + | 86  | +  | 65  | + | 45   | + | 22   | -1   | -25 | -47 | - | 68  | - | 87  | - | 104 | - | 117 | - | 127 | - | 132 | - | 134 | - | 131 | - | 125 |   |   |
| 160    | +  | 92  | + | 91   | + | 87  | +  | 80  | + | 70   | + | 59  | +  | 45  | + | 31   | + | 16   | -1   | -18 | -33 | - | 48  | - | 60  | - | 71  | - | 81  | - | 88  | - | 91  | - | 92  | - | 91  | - | 86  |   |   |
| 170    | +  | 48  | + | 48   | + | 46  | +  | 42  | + | 37   | + | 31  | +  | 24  | + | 16   | + | 9    | -1   | -9  | -17 | - | 25  | - | 32  | - | 37  | - | 43  | - | 46  | - | 48  | - | 48  | - | 48  | - | 45  |   |   |
| 180    | +  | 5   | + | 5  | + | 3   | +  | 3   | + | 3  | + | 2   | +  | 2   | + | 1  | + | 1    | 0  | -1  | -1  | - | 2   | - | 2   | - | 3   | - | 3   | - | 5   | - | 5   | - | 5   | - | 5   | - | 3   |   |   |
| 190    | -  | 41  | - | 40   | - | 39  | -  | 36  | - | 31   | - | 27  | -  | 20  | - | 14   | - | 6    | +1   | +7  | +15 | + | 21  | + | 27  | + | 32  | + | 36  | + | 39  | + | 40  | + | 41  | + | 40  | + | 39  |   |   |
| 200    | -  | 85  | - | 84   | - | 80  | -  | 73  | - | 65   | - | 54  | -  | 42  | - | 28   | - | 14   | +1   | +15 | +30 | + | 43  | + | 55  | + | 66  | + | 74  | + | 81  | + | 84  | + | 85  | + | 84  | + | 79  |   |   |
| 210    | -  | 127 | - | 125  | - | 119 | -  | 110 | - | 97   | - | 81  | -  | 63  | - | 42   | - | 22   | +1   | +23 | +45 | + | 65  | + | 83  | + | 99  | + | 111 | + | 120 | + | 125 | + | 127 | + | 124 | + | 118 |   |   |
| 220    | -  | 164 | - | 162  | - | 154 | -  | 142 | - | 125  | - | 105 | -  | 81  | - | 55   | - | 28   | +2   | +31 | +58 | + | 84  | + | 107 | + | 128 | + | 144 | + | 156 | + | 163 | + | 164 | + | 162 | + | 154 |   |   |
| 230    | -  | 198 | - | 195  | - | 186 | -  | 171 | - | 150  | - | 127 | -  | 97  | - | 66   | - | 33   | +2   | +37 | +69 | + | 101 | + | 129 | + | 153 | + | 173 | + | 187 | + | 196 | + | 198 | + | 194 | + | 184 |   |   |
| 240    | -  | 224 | - | 221  | - | 211 | -  | 194 | - | 171  | - | 144 | -  | 110 | - | 74   | - | 38   | +3   | +42 | +79 | + | 115 | + | 146 | + | 175 | + | 197 | + | 212 | + | 222 | + | 224 | + | 220 | + | 209 |   |   |
| 250    | -  | 245 | - | 242  | - | 230 | -  | 212 | - | 187  | - | 157 | -  | 120 | - | 82   | - | 41   | +3   | +46 | +87 | + | 125 | + | 159 | + | 190 | + | 215 | + | 232 | + | 243 | + | 245 | + | 241 | + | 229 |   |   |
| 260    | -  | 258 | - | 254  | - | 242 | -  | 223 | - | 197  | - | 166 | -  | 128 | - | 86   | - | 43   | +3   | +48 | +91 | + | 132 | + | 169 | + | 201 | + | 226 | + | 244 | + | 255 | + | 258 | + | 254 | + | 240 |   |   |
| 270    | -  | 264 | - | 260  | - | 248 | -  | 228 | - | 201  | - | 169 | -  | 130 | - | 88   | - | 44   | +3   | +49 | +93 | + | 135 | + | 172 | + | 205 | + | 231 | + | 250 | + | 261 | + | 264 | + | 259 | + | 246 |   |   |
| 280    | -  | 261 | - | 257  | - | 245 | -  | 225 | - | 199  | - | 167 | -  | 129 | - | 87   | - | 44   | +3   | +48 | +92 | + | 134 | + | 170 | + | 203 | + | 228 | + | 247 | + | 258 | + | 261 | + | 256 | + | 243 |   |   |
| 290    | -  | 252 | - | 248  | - | 236 | -  | 217 | - | 192  | - | 161 | -  | 123 | - | 84   | - | 42   | +3   | +47 | +88 | + | 129 | + | 164 | + | 196 | + | 220 | + | 238 | + | 249 | + | 252 | + | 247 | + | 234 |   |   |
| 300    | -  | 235 | - | 230  | - | 219 | -  | 202 | - | 178  | - | 150 | -  | 116 | - | 79   | - | 39   | +3   | +43 | +83 | + | 120 | + | 153 | + | 182 | + | 203 | + | 221 | + | 231 | + | 235 | + | 229 | + | 218 |   |   |
| 310    | -  | 210 | - | 207  | - | 197 | -  | 182 | - | 160  | - | 134 | -  | 103 | - | 70   | - | 35   | +2   | +39 | +74 | + | 107 | + | 137 | + | 164 | + | 184 | + | 199 | + | 208 | + | 210 | + | 206 | + | 196 |   |   |
| 320    | -  | 179 | - | 176  | - | 168 | -  | 155 | - | 137  | - | 115 | -  | 88  | - | 60   | - | 29   | +2   | +33 | +63 | + | 91  | + | 117 | + | 139 | + | 157 | + | 170 | + | 177 | + | 179 | + | 176 | + | 167 |   |   |
| 330    | -  | 144 | - | 142  | - | 135 | -  | 124 | - | 109  | - | 92  | -  | 70  | - | 48   | - | 23   | +2   | +26 | +51 | + | 73  | + | 94  | + | 111 | + | 125 | + | 137 | + | 142 | + | 144 | + | 141 | + | 133 |   |   |
| 340    | -  | 104 | - | 102  | - | 97  | -  | 90  | - | 79   | - | 66  | -  | 52  | - | 35   | - | 18   | +1   | +20 | +36 | + | 53  | + | 68  | + | 80  | + | 91  | + | 98  | + | 102 | + | 104 | + | 102 | + | 97  |   |   |
| 350    | -  | 60  | - | 59   | - | 57  | -  | 52  | - | 45   | - | 39  | -  | 30  | - | 20   | - | 10   | +1   | +12 | +21 | + | 31  | + | 39  | + | 46  | + | 53  | + | 57  | + | 59  | + | 60  | + | 59  | + | 56  |   |   |
| 360    | -  | 15  | - | 15   | - | 15  | -  | 14  | - | 11   | - | 10  | -  | 8   | - | 5  | - | 1    | 0  | +3  | +5  | + | 8   | + | 10  | + | 13  | + | 14  | + | 15  | + | 15  | + | 15  | + | 15  | + | 15  |   |   |
| 370    | +  | 30  | + | 30   | + | 28  | +  | 26  | + | 23   | + | 19  | +  | 14  | + | 10   | + | 5    | 0  | -5  | -11 | - | 15  | - | 20  | - | 23  | - | 26  | - | 28  | - | 30  | - | 30  | - | 29  | - | 28  |   |   |
| 380    | +  | 74  | + | 73   | + | 69  | +  | 64  | + | 57   | + | 47  | +  | 36  | + | 25   | + | 12>< |  |     |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |   |

No Constant has been applied.

The unit equals 0<sup>d.000000</sup>.

This equation applies for Occultations only.

Its natural sign must be regarded.

# SATELLITE III

## Tables of the Phenomena

LXIII *continued*

Equation of the Reduction

Occultations

| $\gamma$ | $4^d 0$ | $4^d 2$ | $4^d 4$ | $4^d 6$ | $4^d 8$ | $5^d 0$ | $5^d 2$ | $5^d 4$ | $5^d 6$ | $5^d 8$ | $6^d 0$ | $6^d 2$ | $6^d 4$ | $6^d 6$ | $6^d 8$ | $7^d 0$ | $7^d 2$ | $7^d 4$ | $7^d 6$ | $7^d 8$ | $8^d 0$ |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0        | - 8     | - 7     | - 6     | - 5     | - 4     | - 3     | - 1     | 0       | + 1     | + 3     | + 4     | + 6     | + 6     | + 7     | + 8     | + 9     | + 9     | + 8     | + 8     | + 7     | + 6     |
| 10       | - 50    | - 45    | - 41    | - 33    | - 5     | - 17    | - 8     | +       | + 11    | + 0     | + 8     | + 36    | + 42    | + 47    | + 51    | + 53    | + 54    | + 52    | + 49    | + 45    | + 40    |
| 20       | - 90    | - 8     | - 73    | - 6     | - 47    | - 30    | - 14    | + 3     | + 19    | + 36    | + 51    | + 65    | + 77    | + 85    | + 92    | + 96    | + 97    | + 95    | + 89    | + 81    | + 71    |
| 30       | - 19    | - 117   | - 13    | - 85    | - 66    | - 43    | - 0     | + 4     | + 8     | + 51    | + 73    | + 9     | + 108   | + 122   | + 13    | + 136   | + 137   | + 134   | + 18    | + 116   | + 101   |
| 40       | - 6     | - 148   | - 13    | - 108   | - 83    | - 54    | - 5     | + 5     | + 35    | + 64    | + 93    | + 116   | + 137   | + 154   | + 166   | + 173   | + 174   | + 170   | + 161   | + 147   | + 128   |
| 50       | - 191   | - 175   | - 154   | - 18    | - 98    | - 64    | - 30    | + 6     | + 42    | + 76    | + 109   | + 138   | + 161   | + 181   | + 195   | + 204   | + 206   | + 201   | + 190   | + 173   | + 151   |
| 60       | - 215   | - 97    | - 173   | - 143   | - 110   | - 73    | - 33    | + 7     | + 48    | + 85    | + 1     | + 155   | + 182   | + 204   | + 220   | + 229   | + 230   | + 26    | + 214   | + 195   | + 170   |
| 70       | - 32    | - 212   | - 187   | - 154   | - 119   | - 79    | - 36    | + 8     | + 51    | + 93    | + 132   | + 167   | + 196   | + 20    | + 237   | + 247   | + 249   | + 244   | + 230   | + 10    | + 183   |
| 80       | - 43    | - 3     | - 196   | - 16    | - 125   | - 82    | - 38    | + 8     | + 53    | + 97    | + 138   | + 175   | + 205   | + 230   | + 248   | + 259   | + 261   | + 255   | + 241   | + 221   | + 192   |
| 90       | - 46    | - 25    | - 198   | - 164   | - 126   | - 83    | - 38    | + 8     | + 54    | + 98    | + 140   | + 177   | + 208   | + 33    | + 251   | + 62    | + 264   | + 58    | + 244   | + 223   | + 194   |
| 100      | - 4     | -       | - 194   | - 161   | - 124   | - 81    | - 37    | + 8     | + 53    | + 96    | + 137   | + 174   | + 04    | + 230   | + 247   | + 258   | + 260   | + 254   | + 40    | + 220   | + 190   |
| 110      | - 31    | - 211   | - 186   | - 154   | - 119   | - 78    | - 35    | + 7     | + 50    | + 9     | + 132   | + 166   | + 195   | + 219   | + 235   | + 246   | + 48    | + 42    | + 229   | + 209   | + 182   |
| 120      | - 13    | - 194   | - 171   | - 142   | - 19    | - 7     | - 33    | + 7     | + 46    | + 85    | + 11    | + 153   | + 180   | + 21    | + 218   | + 227   | + 229   | + 224   | + 212   | + 193   | + 168   |
| 130      | - 189   | - 173   | - 15    | - 125   | - 97    | - 64    | - 9     | + 6     | + 41    | + 75    | + 107   | + 135   | + 160   | + 179   | + 193   | + 01    | + 202   | + 198   | + 187   | + 171   | + 149   |
| 140      | - 158   | - 145   | - 18    | - 16    | - 81    | - 54    | - 4     | + 5     | + 34    | + 63    | + 9     | + 115   | + 134   | + 150   | + 162   | + 169   | + 170   | + 166   | + 157   | + 144   | + 125   |
| 150      | - 15    | - 114   | - 10    | - 83    | - 63    | - 42    | - 19    | + 4     | + 28    | + 50    | + 70    | + 90    | + 105   | + 118   | + 127   | + 133   | + 134   | + 131   | + 14    | + 113   | + 98    |
| 160      | - 86    | - 79    | - 69    | - 58    | - 44    | - 29    | - 13    | + 3     | + 19    | + 34    | + 49    | + 6     | + 73    | + 82    | + 88    | + 92    | + 92    | + 90    | + 86    | + 79    | + 68    |
| 170      | - 45    | - 4     | - 36    | - 30    | - 4     | - 15    | - 7     | + 1     | + 10    | + 18    | + 6     | + 3     | + 39    | + 43    | + 46    | + 48    | + 48    | + 47    | + 45    | + 41    | + 35    |
| 180      | - 3     | - 3     | - 3     | - 2     | - 2     | - 1     | -       | -       | -       | + 1     | + 1     | + 2     | + 3     | + 3     | + 5     | + 5     | + 5     | + 5     | + 3     | + 3     | + 3     |
| 190      | + 39    | + 35    | + 31    | + 26    | + 19    | + 13    | + 6     | - 1     | - 8     | - 16    | -       | - 28    | - 32    | - 37    | - 39    | - 41    | - 41    | - 40    | - 38    | - 35    | - 30    |
| 200      | + 79    | + 7     | + 64    | + 53    | + 41    | + 27    | + 13    | - 3     | - 17    | - 32    | - 45    | - 57    | - 67    | - 75    | - 81    | - 85    | - 85    | - 83    | - 78    | - 71    | - 63    |
| 210      | + 118   | + 19    | + 97    | + 79    | + 61    | + 40    | + 19    | - 4     | - 26    | - 47    | - 67    | - 85    | - 100   | - 112   | - 10    | - 126   | - 127   | - 14    | - 117   | - 108   | - 93    |
| 220      | + 154   | + 140   | + 13    | + 10    | + 77    | + 5     | + 24    | - 5     | - 33    | 61      | - 88    | - 110   | - 130   | - 145   | - 157   | - 164   | - 164   | - 161   | - 15    | - 139   | - 11    |
| 230      | + 184   | + 168   | + 148   | + 13    | + 92    | + 62    | + 9     | - 6     | - 40    | - 73    | - 105   | - 133   | - 155   | - 174   | - 188   | - 196   | - 198   | - 193   | - 183   | - 167   | - 145   |
| 240      | + 9     | + 19    | + 169   | + 140   | + 107   | + 7     | + 33    | - 7     | - 46    | - 83    | - 119   | - 151   | - 177   | - 199   | - 213   | - 223   | - 224   | - 219   | - 206   | - 190   | - 165   |
| 250      | + 29    | + 209   | + 184   | + 15    | + 117   | + 77    | + 35    | - 7     | - 50    | - 91    | - 130   | - 164   | - 193   | - 15    | - 233   | - 243   | - 245   | - 40    | - 227   | - 207   | - 180   |
| 260      | + 240   | + 2     | + 194   | + 161   | + 124   | + 81    | + 37    | - 8     | - 53    | - 96    | - 137   | - 174   | - 04    | - 28    | - 245   | - 256   | - 258   | - 25    | - 238   | - 218   | - 190   |
| 270      | + 46    | + 5     | + 198   | + 164   | + 126   | + 83    | + 38    | - 8     | - 54    | - 98    | - 140   | - 177   | - 208   | - 33    | - 251   | - 262   | - 64    | - 258   | - 44    | - 223   | - 194   |
| 280      | + 43    | + 3     | + 196   | + 162   | + 15    | + 8     | + 38    | - 8     | - 53    | - 97    | - 138   | - 175   | - 06    | - 230   | - 248   | - 259   | - 261   | - 255   | - 41    | - 21    | - 19    |
| 290      | + 34    | + 215   | + 189   | + 157   | + 10    | + 79    | + 36    | - 8     | - 51    | - 93    | - 133   | - 169   | - 198   | - 22    | - 239   | - 250   | - 52    | - 246   | - 233   | - 213   | - 185   |
| 300      | + 18    | + 199   | + 175   | + 145   | + 11    | + 73    | + 33    | - 7     | - 48    | - 87    | - 14    | - 157   | - 184   | - 206   | -       | - 233   | - 35    | - 228   | - 216   | - 197   | - 172   |
| 310      | + 196   | + 179   | + 157   | + 13    | + 100   | + 66    | + 30    | - 6     | - 43    | - 78    | - 111   | - 14    | - 166   | - 186   | - 00    | - 208   | - 210   | - 205   | - 194   | - 178   | - 154   |
| 320      | + 167   | + 153   | + 135   | + 111   | + 85    | + 57    | + 25    | - 5     | - 36    | 67      | - 95    | - 11    | - 141   | 158     | - 170   | - 178   | - 179   | - 175   | - 165   | - 151   | - 13    |
| 330      | + 133   | + 1     | + 18    | + 90    | + 68    | + 45    | + 20    | - 4     | - 3     | - 53    | - 76    | - 97    | - 113   | - 16    | - 137   | 143     | - 144   | - 141   | - 13    | - 121   | - 106   |
| 340      | + 97    | + 89    | + 77    | + 64    | + 49    | + 33    | + 14    | - 3     | -       | - 38    | - 55    | - 69    | - 81    | - 92    | - 99    | - 103   | - 104   | - 101   | - 96    | - 88    | - 76    |
| 350      | + 56    | + 52    | + 45    | + 37    | + 28    | + 19    | + 8     | -       | - 13    | - 22    | - 3     | - 4     | - 47    | - 53    | - 57    | - 60    | - 60    | - 59    | - 56    | - 51    | - 44    |
| 360      | + 15    | + 14    | + 11    | + 10    | + 8     | + 5     | + 2     | 0       | - 4     | - 6     | - 9     | - 10    | - 13    | - 14    | - 15    | - 15    | - 15    | - 15    | - 14    | - 13    | - 11    |
| 370      | - 28    | - 5     | - 3     | - 19    | - 14    | - 9     | - 5     | + 1     | + 6     | + 11    | + 16    | + 20    | + 23    | + 26    | + 28    | + 3     | + 3     | + 29    | + 28    | + 5     | + 22    |
| 380      | - 69    | - 63    | - 56    | - 46    | - 36    | - 23    | - 11    | + 2     | + 15    | + 8     | + 39    | + 50    | + 59    | + 65    | + 70    | + 74    | + 74    | + 72    | + 68    | + 6     | + 55    |
| 390      | - 108   | - 1     | - 87    | - 7     | - 56    | - 37    | - 17    | + 4     | + 3     | + 43    | + 61    | + 78    | + 92    | + 10    | + 110   | + 115   | + 116   | + 114   | + 107   | + 99    | + 86    |
| 400      | - 145   | 133     | - 116   | - 96    | - 74    | - 49    | - 23    | + 5     | + 31    | + 58    | + 83    | + 14    | + 12    | + 137   | + 148   | + 154   | + 155   | + 152   | + 144   | + 131   | + 114   |

N C t th b d d d

Th t q l ooooo

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It t alig m t b g d d



# SATELLITE III

## Tables of the Phenomena

LXIV

Equation of the Reduction

Transits

| $\gamma$ | $\alpha$ | $0^d.0$ | $0^d.2$ | $0^d.4$ | $0^d.6$ | $0^d.8$ | $1^d.0$ | $1^d.2$ | $1^d.4$ | $1^d.6$ | $1^d.8$ | $2^d.0$ | $2^d.2$ | $2^d.4$ | $2^d.6$ | $2^d.8$ | $3^d.0$ | $3^d.2$ | $3^d.4$ | $3^d.6$ | $3^d.8$ | $4^d.0$ |
|----------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| $\alpha$ | $0$      | - 11    | - 11    | - 10    | - 9     | - 9     | - 7     | - 5     | - 4     | - 2     | 0       | + 2     | + 4     | + 6     | + 7     | + 9     | + 9     | + 10    | + 11    | + 11    | + 11    | + 10    |
|          | 10       | - 70    | - 69    | - 66    | - 60    | - 54    | - 44    | - 35    | - 24    | - 11    | + 1     | + 13    | + 25    | + 36    | + 45    | + 55    | + 61    | + 66    | + 69    | + 70    | + 69    | + 65    |
|          | 20       | - 126   | - 125   | - 118   | - 110   | - 96    | - 81    | - 62    | - 42    | - 21    | + 1     | + 23    | + 45    | + 65    | + 82    | + 98    | + 111   | + 119   | + 125   | + 126   | + 124   | + 118   |
|          | 30       | - 180   | - 178   | - 169   | - 155   | - 137   | - 115   | - 88    | - 60    | - 29    | + 2     | + 33    | + 64    | + 92    | + 117   | + 139   | + 157   | + 170   | + 178   | + 180   | + 176   | + 168   |
|          | 40       | - 227   | - 224   | - 213   | - 196   | - 174   | - 145   | - 112   | - 76    | - 37    | + 2     | + 42    | + 80    | + 116   | + 148   | + 176   | + 199   | + 215   | + 225   | + 227   | + 223   | + 212   |
|          | 50       | - 268   | - 264   | - 253   | - 232   | - 205   | - 171   | - 133   | - 89    | - 45    | + 2     | + 50    | + 95    | + 138   | + 175   | + 209   | + 235   | + 254   | + 265   | + 268   | + 263   | + 251   |
|          | 60       | - 302   | - 297   | - 283   | - 260   | - 229   | - 193   | - 149   | - 100   | - 50    | + 3     | + 56    | + 106   | + 155   | + 197   | + 234   | + 264   | + 285   | + 298   | + 302   | + 295   | + 281   |
|          | 70       | - 326   | - 321   | - 306   | - 282   | - 248   | - 208   | - 160   | - 109   | - 54    | + 3     | + 61    | + 116   | + 167   | + 212   | + 253   | + 285   | + 308   | + 322   | + 326   | + 319   | + 304   |
|          | 80       | - 340   | - 335   | - 319   | - 294   | - 260   | - 218   | - 168   | - 114   | - 56    | + 3     | + 63    | + 121   | + 175   | + 223   | + 264   | + 298   | + 321   | + 336   | + 340   | + 333   | + 317   |
|          | 90       | - 345   | - 340   | - 324   | - 298   | - 263   | - 220   | - 170   | - 115   | - 57    | + 3     | + 64    | + 122   | + 177   | + 225   | + 268   | + 302   | + 326   | + 341   | + 345   | + 338   | + 322   |
|          | 100      | - 339   | - 335   | - 319   | - 293   | - 259   | - 217   | - 167   | - 113   | - 56    | + 3     | + 63    | + 120   | + 174   | + 222   | + 264   | + 297   | + 321   | + 336   | + 339   | + 333   | + 317   |
|          | 110      | - 324   | - 319   | - 304   | - 279   | - 247   | - 206   | - 160   | - 108   | - 53    | + 3     | + 60    | + 115   | + 166   | + 211   | + 251   | + 283   | + 305   | + 319   | + 323   | + 317   | + 302   |
|          | 120      | - 298   | - 294   | - 280   | - 258   | - 228   | - 190   | - 147   | - 100   | - 49    | + 3     | + 55    | + 108   | + 153   | + 194   | + 232   | + 261   | + 282   | + 295   | + 298   | + 292   | + 279   |
|          | 130      | - 265   | - 261   | - 249   | - 228   | - 202   | - 169   | - 130   | - 88    | - 43    | + 2     | + 50    | + 94    | + 135   | + 173   | + 205   | + 231   | + 250   | + 262   | + 265   | + 260   | + 247   |
|          | 140      | - 222   | - 219   | - 209   | - 192   | - 169   | - 142   | - 110   | - 74    | - 37    | + 2     | + 42    | + 79    | + 115   | + 145   | + 172   | + 195   | + 210   | + 220   | + 222   | + 218   | + 208   |
|          | 150      | - 175   | - 173   | - 164   | - 151   | - 133   | - 111   | - 86    | - 58    | - 29    | + 2     | + 33    | + 62    | + 90    | + 114   | + 136   | + 153   | + 165   | + 173   | + 175   | + 172   | + 163   |
|          | 160      | - 121   | - 119   | - 114   | - 104   | - 92    | - 78    | - 60    | - 40    | - 20    | + 1     | + 23    | + 42    | + 62    | + 79    | + 94    | + 105   | + 115   | + 120   | + 121   | + 119   | + 113   |
|          | 170      | - 63    | - 62    | - 60    | - 55    | - 48    | - 41    | - 31    | - 21    | - 11    | + 1     | + 12    | + 22    | + 32    | + 42    | + 49    | + 56    | + 60    | + 63    | + 63    | + 62    | + 59    |
|          | 180      | - 6     | - 6     | - 6     | - 5     | - 5     | - 3     | - 2     | - 2     | - 1     | 0       | + 1     | + 2     | + 2     | + 3     | + 5     | + 5     | + 6     | + 6     | + 6     | + 6     | + 6     |
|          | 190      | + 54    | + 53    | + 50    | + 47    | + 41    | + 34    | + 27    | + 18    | + 9     | - 1     | - 10    | - 19    | - 28    | - 35    | - 42    | - 47    | - 50    | - 53    | - 54    | - 52    | - 50    |
|          | 200      | + 111   | + 110   | + 104   | + 97    | + 85    | + 70    | + 55    | + 37    | + 18    | - 1     | - 20    | - 40    | - 57    | - 72    | - 87    | - 98    | - 105   | - 110   | - 111   | - 109   | - 104   |
|          | 210      | + 166   | + 163   | + 156   | + 144   | + 126   | + 106   | + 82    | + 56    | + 27    | - 1     | - 30    | - 59    | - 85    | - 109   | - 129   | - 146   | - 157   | - 164   | - 166   | - 162   | - 155   |
|          | 220      | + 215   | + 212   | + 202   | + 186   | + 164   | + 137   | + 106   | + 72    | + 35    | - 2     | - 40    | - 76    | - 110   | - 140   | - 167   | - 188   | - 203   | - 213   | - 215   | - 211   | - 201   |
|          | 230      | + 258   | + 254   | + 242   | + 224   | + 197   | + 165   | + 128   | + 86    | + 43    | - 2     | - 47    | - 91    | - 133   | - 168   | - 201   | - 227   | - 244   | - 255   | - 258   | - 253   | - 241   |
|          | 240      | + 294   | + 289   | + 276   | + 253   | + 223   | + 188   | + 145   | + 98    | + 49    | - 3     | - 55    | - 104   | - 151   | - 192   | - 228   | - 257   | - 277   | - 290   | - 294   | - 288   | - 274   |
|          | 250      | + 320   | + 316   | + 301   | + 277   | + 244   | + 204   | + 158   | + 106   | + 53    | - 3     | - 60    | - 113   | - 164   | - 209   | - 249   | - 281   | - 303   | - 317   | - 321   | - 314   | - 299   |
|          | 260      | + 337   | + 333   | + 317   | + 291   | + 257   | + 215   | + 167   | + 113   | + 56    | - 3     | - 63    | - 120   | - 174   | - 220   | - 262   | - 295   | - 319   | - 334   | - 337   | - 331   | - 315   |
|          | 270      | + 345   | + 340   | + 324   | + 298   | + 263   | + 220   | + 170   | + 115   | + 57    | - 3     | - 64    | - 122   | - 177   | - 225   | - 268   | - 302   | - 326   | - 341   | - 345   | - 338   | - 322   |
|          | 280      | + 342   | + 337   | + 321   | + 296   | + 260   | + 218   | + 168   | + 114   | + 56    | - 3     | - 63    | - 121   | - 175   | - 223   | - 265   | - 300   | - 323   | - 338   | - 342   | - 335   | - 319   |
|          | 290      | + 328   | + 324   | + 308   | + 284   | + 251   | + 210   | + 162   | + 109   | + 54    | - 3     | - 62    | - 116   | - 169   | - 215   | - 255   | - 288   | - 310   | - 325   | - 328   | - 322   | - 307   |
|          | 300      | + 306   | + 302   | + 287   | + 265   | + 234   | + 195   | + 151   | + 102   | + 50    | - 3     | - 56    | - 108   | - 157   | - 199   | - 238   | - 268   | - 289   | - 302   | - 306   | - 300   | - 286   |
|          | 310      | + 275   | + 271   | + 257   | + 237   | + 209   | + 175   | + 135   | + 92    | + 45    | - 2     | - 50    | - 97    | - 140   | - 179   | - 213   | - 240   | - 259   | - 272   | - 275   | - 269   | - 256   |
|          | 320      | + 234   | + 231   | + 220   | + 203   | + 178   | + 149   | + 116   | + 78    | + 39    | - 2     | - 44    | - 83    | - 121   | - 153   | - 182   | - 205   | - 221   | - 231   | - 234   | - 229   | - 219   |
|          | 330      | + 187   | + 185   | + 176   | + 162   | + 143   | + 119   | + 93    | + 62    | + 31    | - 2     | - 35    | - 66    | - 97    | - 122   | - 146   | - 164   | - 177   | - 185   | - 187   | - 183   | - 175   |
|          | 340      | + 135   | + 134   | + 127   | + 117   | + 103   | + 87    | + 67    | + 45    | + 23    | - 1     | - 25    | - 47    | - 69    | - 89    | - 105   | - 118   | - 128   | - 134   | - 135   | - 133   | - 127   |
|          | 350      | + 79    | + 77    | + 74    | + 68    | + 60    | + 51    | + 39    | + 26    | + 13    | - 1     | - 15    | - 27    | - 40    | - 52    | - 61    | - 69    | - 74    | - 78    | - 79    | - 77    | - 74    |
|          | 360      | + 20    | + 20    | + 19    | + 18    | + 15    | + 13    | + 10    | + 6     | + 4     | 0       | - 4     | - 8     | - 10    | - 14    | - 15    | - 18    | - 19    | - 20    | - 20    | - 20    | - 19    |
|          | 370      | - 39    | - 39    | - 37    | - 33    | - 30    | - 25    | - 19    | - 13    | - 6     | 0       | + 7     | + 14    | + 20    | + 25    | + 31    | + 34    | + 37    | + 39    | + 39    | + 38    | + 36    |
|          | 380      | - 97    | - 95    | - 91    | - 84    | - 74    | - 61    | - 48    | - 33    | - 16    | + 1     | + 18    | + 35    | + 50    | + 63    | + 75    | + 84    | + 91    | + 96    | + 97    | + 95    | + 90    |
|          | 390      | - 152   | - 150   | - 142   | - 132   | - 116   | - 97    | - 75    | - 51    | - 25    | + 1     | + 28    | + 54    | + 78    | + 100   | + 118   | + 134   | + 143   | + 150   | + 152   | + 149   | + 142   |
|          | 400      | - 203   | - 200   | - 191   | - 175   | - 154   | - 130   | - 100   | - 68    | - 33    | + 2     | + 37    | + 72    | + 104   | + 133   | + 157   | + 178   | + 192   | + 201   | + 203   | + 199   | + 190   |

No Constant has been added.

The unit equals  $0^d.000001$ .

This equation applies for Transits only.

Its natural sign must be regarded.

# SATELLITE III

## Tables of the Phenomena

LXIV *continued*

Equation of the Reduction

Transits

| $\gamma$ | $4^d 0$ | $4^d 2$ | $4^d 4$ | $4^d 6$ | $4^d 8$ | $5^d 0$ | $5^d 2$ | $5^d 4$ | $5^d 6$ | $5^d 8$ | $6^d 0$ | $6^d 2$ | $6^d 4$ | $6^d 6$ | $6^d 8$ | $7^d 0$ | $7^d 2$ | $7^d 4$ | $7^d 6$ | $7^d 8$ | $8^d 0$ |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0        | + 10    | + 9     | + 8     | + 6     | + 5     | + 4     | + 1     | 0       | - 2     | - 3     | - 6     | - 7     | - 9     | - 9     | - 10    | - 11    | - 11    | - 11    | - 10    | - 9     | - 8     |
| 10       | + 65    | + 59    | + 53    | + 43    | + 33    | + 24    | + 10    | - 14    | - 26    | - 26    | 37      | - 47    | - 55    | 62      | - 67    | - 70    | - 70    | - 68    | - 65    | - 59    | - 52    |
| 20       | + 118   | + 109   | + 95    | + 79    | + 60    | + 40    | + 18    | - 4     | - 26    | - 48    | - 67    | - 84    | 100     | - 11    | - 10    | - 15    | - 126   | - 13    | - 117   | - 107   | - 93    |
| 30       | + 168   | + 156   | + 135   | + 112   | + 85    | + 57    | + 6     | - 6     | - 37    | - 67    | - 95    | - 11    | - 141   | - 159   | - 171   | - 179   | - 18    | - 176   | - 166   | - 152   | - 13    |
| 40       | + 21    | + 194   | + 171   | + 142   | + 18    | + 7     | + 33    | - 7     | - 46    | 85      | - 1     | - 152   | - 179   | - 01    | - 216   | - 5     | - 227   | - 2     | - 1     | - 191   | - 168   |
| 50       | + 51    | + 3     | + 02    | + 167   | + 128   | + 85    | + 39    | - 9     | - 55    | - 101   | - 143   | 180     | - 12    | - 38    | - 256   | - 266   | - 268   | - 26    | - 249   | - 227   | - 198   |
| 60       | + 281   | + 58    | + 6     | + 188   | + 143   | + 95    | + 44    | - 10    | - 6     | - 113   | - 160   | - 0     | - 37    | - 66    | - 287   | - 299   | - 302   | - 295   | - 79    | - 254   | - 3     |
| 70       | + 304   | + 79    | + 245   | + 03    | + 154   | + 103   | + 47    | - 1     | - 67    | - 11    | - 172   | - 218   | - 57    | - 88    | - 310   | - 323   | - 326   | - 318   | - 301   | - 275   | - 240   |
| 80       | + 317   | + 91    | + 256   | + 13    | + 162   | + 108   | + 49    | - 11    | - 70    | 128     | - 181   | - 228   | - 268   | - 301   | - 323   | - 337   | - 340   | - 332   | - 314   | - 287   | - 251   |
| 90       | + 32    | + 95    | + 59    | + 15    | + 164   | + 19    | + 50    | - 11    | - 71    | - 19    | - 183   | - 31    | - 7     | - 305   | - 328   | - 342   | - 345   | - 337   | - 319   | - 291   | - 254   |
| 100      | + 317   | + 90    | + 255   | + 1     | + 161   | + 107   | + 49    | - 11    | - 70    | - 17    | - 180   | - 28    | - 68    | - 300   | - 323   | - 337   | - 339   | - 332   | - 314   | - 286   | - 250   |
| 110      | + 3     | + 77    | + 43    | + 20    | + 154   | + 10    | + 47    | - 10    | - 66    | - 121   | - 17    | - 17    | 55      | - 86    | 307     | 320     | 323     | - 316   | - 99    | - 273   | - 238   |
| 120      | + 79    | + 55    | + 24    | + 186   | + 14    | + 95    | + 43    | - 9     | - 61    | - 112   | - 158   | - 199   | - 235   | - 264   | - 284   | - 296   | - 298   | - 291   | - 276   | - 252   | - 220   |
| 130      | + 47    | + 26    | + 199   | + 165   | + 15    | + 84    | + 38    | - 8     | - 55    | - 99    | 140     | - 177   | - 208   | - 33    | - 251   | - 63    | - 65    | - 259   | - 245   | - 23    | - 195   |
| 140      | + 08    | + 191   | + 167   | + 139   | + 16    | + 70    | + 32    | - 7     | - 46    | - 83    | - 118   | - 149   | - 176   | - 197   | - 212   | - 221   | - 22    | - 217   | - 06    | - 188   | - 164   |
| 150      | + 163   | + 149   | + 131   | + 109   | + 83    | + 55    | + 26    | - 5     | - 36    | - 65    | - 93    | 117     | - 138   | - 154   | - 166   | 174     | - 175   | - 171   | - 161   | - 147   | - 19    |
| 160      | + 113   | + 103   | + 91    | + 75    | + 58    | + 38    | + 18    | - 4     | - 25    | - 45    | - 64    | - 81    | - 95    | - 107   | - 115   | - 120   | - 121   | - 118   | 112     | - 10    | - 89    |
| 170      | + 59    | + 55    | + 48    | + 4     | + 30    | + 0     | + 10    | -       | - 13    | - 24    | - 33    | - 43    | 50      | - 56    | - 60    | - 63    | - 63    | - 6     | - 59    | - 54    | - 47    |
| 180      | + 6     | + 5     | + 5     | + 3     | + 2     | + 1     | + 1     | 0       | 1       | -       | 3       | - 3     | - 5     | - 5     | - 6     | - 6     | - 6     | - 6     | - 5     | - 5     | - 5     |
| 190      | - 50    | - 46    | - 40    | - 34    | 6       | - 17    | - 8     | +       | + 11    | + 0     | + 8     | + 36    | + 4     | + 48    | + 51    | + 53    | + 54    | + 53    | + 50    | + 45    | + 39    |
| 200      | - 104   | - 96    | 84      | - 70    | - 53    | - 35    | - 16    | +       | + 23    | + 42    | + 59    | + 74    | + 88    | + 98    | + 106   | + 110   | + 111   | + 109   | + 103   | + 94    | + 82    |
| 210      | - 155   | - 14    | - 15    | - 104   | - 79    | - 53    | - 4     | +       | + 34    | + 62    | + 88    | + 111   | + 131   | + 147   | + 157   | + 164   | + 166   | + 162   | + 154   | + 140   | + 12    |
| 220      | - 1     | - 184   | - 16    | - 134   | 102     | - 68    | - 32    | +       | + 44    | + 81    | + 114   | + 144   | + 169   | + 190   | + 05    | + 213   | + 215   | + 210   | + 199   | + 181   | + 159   |
| 230      | - 41    | - 21    | - 194   | - 161   | - 123   | - 8     | 38      | +       | + 53    | + 97    | + 138   | + 173   | + 204   | + 229   | + 245   | + 56    | + 258   | + 252   | + 238   | + 218   | + 190   |
| 240      | - 74    | - 51    | - 20    | - 183   | - 140   | - 9     | - 43    | +       | + 61    | + 110   | + 156   | + 197   | + 231   | + 259   | + 279   | + 91    | + 294   | + 287   | + 71    | + 247   | + 16    |
| 250      | - 99    | - 74    | - 41    | - 00    | - 15    | - 101   | - 47    | +       | + 66    | + 119   | + 170   | + 215   | + 253   | + 284   | + 305   | + 318   | + 321   | + 313   | + 97    | + 271   | + 236   |
| 260      | - 315   | - 288   | - 253   | - 10    | - 161   | - 107   | - 49    | +       | + 11    | + 127   | + 180   | + 226   | + 66    | + 298   | + 321   | + 335   | + 337   | + 330   | + 312   | + 284   | + 248   |
| 270      | - 32    | - 95    | - 259   | - 215   | - 164   | - 109   | - 50    | +       | + 11    | + 129   | + 183   | + 231   | + 272   | + 305   | + 328   | + 342   | + 345   | + 337   | + 319   | + 91    | + 54    |
| 280      | - 319   | - 293   | - 256   | - 13    | - 162   | - 108   | - 49    | +       | + 11    | + 128   | + 181   | + 228   | + 269   | + 303   | + 325   | + 339   | + 342   | + 334   | + 316   | + 288   | + 51    |
| 290      | - 30    | - 281   | - 47    | - 05    | - 157   | - 13    | - 47    | +       | + 10    | + 122   | + 175   | + 220   | + 259   | + 90    | + 312   | + 36    | + 328   | + 321   | + 304   | + 277   | + 42    |
| 300      | - 86    | - 262   | - 29    | - 190   | - 145   | - 97    | - 44    | +       | + 10    | + 115   | + 162   | + 205   | + 42    | + 271   | + 291   | + 303   | + 306   | + 299   | + 83    | + 58    | + 25    |
| 310      | - 56    | - 234   | - 06    | - 171   | - 130   | - 87    | - 39    | +       | + 9     | + 103   | + 145   | + 184   | + 16    | + 242   | + 260   | + 72    | + 75    | + 269   | + 253   | + 231   | + 22    |
| 320      | - 19    | - 01    | - 176   | - 146   | - 111   | - 74    | - 34    | +       | + 7     | + 87    | + 15    | + 157   | + 184   | + 207   | + 23    | + 232   | + 234   | + 29    | + 217   | + 198   | + 17    |
| 330      | 175     | - 161   | 141     | - 117   | - 90    | - 59    | - 8     | +       | + 6     | + 70    | + 100   | + 125   | + 148   | + 166   | + 178   | + 186   | + 187   | + 183   | + 173   | + 158   | + 137   |
| 340      | - 17    | - 115   | - 12    | - 84    | - 64    | - 43    | - 2     | +       | + 4     | + 50    | + 7     | + 91    | + 17    | + 119   | + 129   | + 134   | + 135   | + 132   | + 16    | + 114   | + 100   |
| 350      | - 74    | - 68    | - 59    | - 49    | - 37    | - 25    | - 12    | +       | + 2     | + 3     | + 42    | + 53    | + 6     | + 70    | + 75    | + 78    | + 79    | + 77    | + 73    | + 66    | + 58    |
| 360      | - 19    | - 18    | - 15    | - 13    | - 10    | - 6     | 3       | +       | + 1     | + 8     | + 11    | + 14    | + 16    | + 18    | + 19    | + 20    | + 0     | + 20    | + 19    | + 18    | + 15    |
| 370      | + 36    | + 33    | + 29    | + 24    | + 19    | + 13    | + 5     | 1       | - 8     | - 14    | - 1     | - 6     | - 31    | - 34    | - 37    | - 39    | - 39    | - 38    | - 36    | - 33    | - 9     |
| 380      | + 90    | + 83    | + 73    | + 60    | + 46    | + 31    | + 13    | - 3     | - 0     | - 36    | - 51    | - 64    | - 76    | - 85    | - 92    | - 96    | - 97    | - 94    | - 89    | - 82    | - 71    |
| 390      | + 142   | + 130   | + 114   | + 95    | + 72    | + 48    | + 2     | - 5     | - 31    | - 57    | - 81    | - 10    | - 120   | - 135   | - 144   | - 151   | - 152   | - 148   | - 141   | - 129   | - 11    |
| 400      | + 190   | + 173   | + 15    | + 17    | + 96    | + 64    | + 30    | 7       | - 41    | - 76    | - 107   | - 136   | - 160   | - 179   | - 193   | - 02    | - 03    | - 199   | - 188   | - 171   | - 150   |

N C t th b d d d

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# SATELLITE III

## Tables of the Phenomena

LXV

Corrections for Phase

Sh., Tr.

| 1                                     | 2          | 3                                    | 4                               | 5                                | 6                               |
|---------------------------------------|------------|--------------------------------------|---------------------------------|----------------------------------|---------------------------------|
| Additional Equation of Semi-duration. | p          | Correcting Factor for Semi-duration. | $\Delta$<br>0 <sup>d</sup> .001 | Correcting Factor for Reduction. | $\Delta$<br>0 <sup>d</sup> .001 |
| d<br>0'000000                         | d<br>0'000 | '000000                              | 0,0                             | '000000                          | 0,0                             |
| o                                     | '004       | — 1                                  | — 0,3                           | o                                | 0,0                             |
| o                                     | '008       | 2                                    | 0,5                             | — 1                              | — 0,1                           |
| o                                     | '012       | 5                                    | 1,0                             | 1                                | 0,1                             |
| o                                     | '016       | 10                                   | 1,3                             | 2                                | 0,3                             |
| o                                     | '020       | 15                                   | 1,6                             | 3                                | 0,3                             |
| 0'000000                              | 0'024      | — '00023                             | — 2,0                           | — '00004                         | — 0,4                           |
| o                                     | '028       | 31                                   | 2,1                             | 6                                | 0,5                             |
| o                                     | '032       | 40                                   | 2,4                             | 8                                | 0,5                             |
| o                                     | '036       | 50                                   | 2,8                             | 10                               | 0,5                             |
| o                                     | '040       | 62                                   | 3,1                             | 12                               | 0,6                             |
| 0'000000                              | 0'044      | — '00075                             | — 3,4                           | — '00015                         | — 0,7                           |
| o                                     | '048       | 89                                   | 3,6                             | 18                               | 0,8                             |
| o                                     | '052       | 104                                  | 4,0                             | 21                               | 0,8                             |
| o                                     | '056       | 121                                  | 4,4                             | 24                               | 0,9                             |
| o                                     | '060       | 139                                  | 4,8                             | 28                               | 1,0                             |
| 0'000000                              | 0'064      | — '00159                             | — 5,0                           | — '00032                         | — 1,0                           |
| o                                     | '068       | 179                                  | 5,1                             | 36                               | 1,0                             |
| o                                     | '072       | 200                                  | 5,5                             | 40                               | 1,1                             |
| o                                     | '076       | 223                                  | 5,9                             | 45                               | 1,3                             |
| o                                     | '080       | 247                                  | 6,1                             | 50                               | 1,3                             |
| 0'000001                              | 0'084      | — '00272                             | — 6,4                           | — '00055                         | — 1,3                           |
| I                                     | '088       | 298                                  | 6,8                             | 60                               | 1,4                             |
| I                                     | '092       | 326                                  | 7,1                             | 66                               | 1,4                             |
| I                                     | '096       | 355                                  | 7,5                             | 71                               | 1,5                             |
| I                                     | '100       | 386                                  | 7,8                             | 78                               | 1,6                             |
| 0'000001                              | 0'104      | — '00417                             | — 8,1                           | — '00084                         | — 1,6                           |
| I                                     | '108       | 451                                  | 8,4                             | 91                               | 1,6                             |
| I                                     | '112       | 484                                  | 8,5                             | 97                               | 1,6                             |
| I                                     | '116       | 519                                  | 8,9                             | 104                              | 1,9                             |
| I                                     | '120       | 555                                  | 9,3                             | 112                              | 1,9                             |
| 0'000001                              | 0'124      | — '00593                             | — 9,6                           | — '00119                         | — 1,9                           |

| 1                                     | 2          | 3                                    | 4                               | 5                                | 6                               |
|---------------------------------------|------------|--------------------------------------|---------------------------------|----------------------------------|---------------------------------|
| Additional Equation of Semi-duration. | p          | Correcting Factor for Semi-duration. | $\Delta$<br>0 <sup>d</sup> .001 | Correcting Factor for Reduction. | $\Delta$<br>0 <sup>d</sup> .001 |
| 0'000001                              | d<br>0'128 | — '00632                             | — 9,8                           | — '00127                         | — 2,0                           |
| I                                     | '132       | 671                                  | 10,0                            | 135                              | 2,1                             |
| I                                     | '136       | 712                                  | 10,4                            | 144                              | 2,1                             |
| I                                     | '140       | 754                                  | 10,8                            | 152                              | 2,1                             |
| I                                     | '144       | 798                                  | 11,3                            | 161                              | 2,3                             |
| I                                     | '148       | 844                                  | 11,5                            | 170                              | 2,4                             |
| 0'000002                              | 0'152      | — '00890                             | — 11,9                          | — '00180                         | — 2,5                           |
| 2                                     | '156       | 939                                  | 12,1                            | 190                              | 2,5                             |
| 2                                     | '160       | 987                                  | 12,3                            | 200                              | 2,5                             |
| 2                                     | '164       | 1037                                 | 12,6                            | 210                              | 2,5                             |
| 2                                     | '168       | 1088                                 | 12,9                            | 220                              | 2,6                             |
| 0'000002                              | 0'172      | — '01140                             | — 13,1                          | — '00231                         | — 2,7                           |
| 2                                     | '176       | 1193                                 | 13,4                            | 242                              | 2,8                             |
| 2                                     | '180       | 1247                                 | 13,8                            | 253                              | 2,9                             |
| 2                                     | '184       | 1303                                 | 14,1                            | 265                              | 3,0                             |
| 2                                     | '188       | 1360                                 | 14,5                            | 277                              | 3,0                             |
| 0'000003                              | 0'192      | — '01419                             | — 15,0                          | — '00289                         | — 3,0                           |
| 3                                     | '196       | 1480                                 | 15,3                            | 301                              | 3,1                             |
| 3                                     | '200       | 1541                                 | 15,4                            | 314                              | 3,3                             |
| 3                                     | '204       | 1603                                 | 15,6                            | 327                              | 3,3                             |
| 3                                     | '208       | 1666                                 | 15,9                            | 340                              | 3,4                             |
| 0'000003                              | 0'212      | — '01730                             | — 16,3                          | — '00354                         | — 3,5                           |
| 3                                     | '216       | 1796                                 | 16,5                            | 368                              | 3,5                             |
| 3                                     | '220       | 1862                                 | 16,6                            | 382                              | 3,5                             |
| 4                                     | '224       | 1929                                 | 17,1                            | 396                              | 3,5                             |
| 4                                     | '228       | 1999                                 | 17,5                            | 410                              | 3,6                             |
| 0'000004                              | 0'232      | — '02069                             | — 17,9                          | — '00425                         | — 3,9                           |
| 4                                     | '236       | 2142                                 | 18,4                            | 441                              | 4,0                             |
| 4                                     | '240       | 2216                                 | 18,6                            | 457                              | 4,0                             |
| 4                                     | '244       | 2291                                 | 18,8                            | 473                              | 4,0                             |
| 4                                     | '248       | 2366                                 | 18,8                            | 489                              | 4,0                             |
| 0'000004                              | 0'252      | — '02441                             | — 18,8                          | — '00505                         | — 4,0                           |

The Argument is the Annual Parallax  $p$ , as computed from the Approximate Tables IV, V, VI.

No Constant has been added to Column 1, which gives an Additional Equation of the Semiduration. Columns 3 and 5 must be multiplied respectively into the Semiduration as taken from Tables XLIX-LV, and the Reduction as taken from Tables LVI-LXIV, and the products taken as further corrections to these quantities.

When  $p$  is positive, these corrections apply to *Ingress* for the Shadow and *Egress* for Transit of Disc; when  $p$  is negative, they apply to *Egress* for the Shadow and *Ingress* for Transit of Disc.

# SATELLITE III

## Tables of the Phenomena

LXVI

Standard Light Curves in Eclipse

| Lat<br>( $\gamma$ ) <sub>0</sub> | 10        | 15<br>05  | 16<br>04  | 17<br>03 | 18<br>02 | 19<br>01 |
|----------------------------------|-----------|-----------|-----------|----------|----------|----------|
| -30                              | m<br>0 01 | m<br>0 01 | m<br>0 01 |          |          |          |
| 28                               | 0         | 0         | 0         |          |          |          |
| 26                               | 04        | 04        | 04        | 04       | 04       | 04       |
| 24                               | 05        | 05        | 05        | 05       | 5        | 05       |
| 22                               | 08        | 08        | 07        | 7        | 7        | 07       |
| 20                               | 11        | 11        | 1         | 1        | 10       | 09       |
| -18                              | 0 15      | 0 15      | 0 15      | 0 15     | 0 15     | 0 14     |
| 16                               | 19        | 19        | 19        | 19       | 19       | 18       |
| 14                               | 23        | 23        | 3         | 3        | 3        | 3        |
| 12                               | 28        | 28        | 8         | 8        | 28       | 8        |
| 10                               | 34        | 34        | 34        | 34       | 33       | 33       |
| -08                              | 4         | 0 4       | 0 4       | 4        | 0 41     | 0 40     |
| 06                               | 49        | 49        | 49        | 49       | 49       | 48       |
| 04                               | 58        | 58        | 58        | 58       | 58       | 57       |
| -02                              | 67        | 67        | 67        | 67       | 67       | 66       |
| 00                               | 0 75      | 0 75      | 0 75      | 0 75     | 75       | 0 75     |

| Lat<br>( $\delta$ ) <sub>0</sub> | 10        | 15<br>05  | 16<br>04  | 17<br>03 | 18<br>02 | 19<br>01 |
|----------------------------------|-----------|-----------|-----------|----------|----------|----------|
| 00                               | m<br>0 75 | m<br>0 75 | m<br>0 75 |          |          |          |
| +02                              | 0 83      | 0 83      | 0 83      | 0 83     | 0 83     | 83       |
| 04                               | 0 95      | 95        | 0 95      | 0 95     | 0 95     | 0 94     |
| 06                               | 1 10      | 1 10      | 1 10      | 1 10     | 1 09     | 1 09     |
| 08                               | 1 6       | 1 25      | 1 5       | 1 5      | 1 4      | 1 24     |
| 10                               | 1 41      | 1 4       | 1 40      | 1 40     | 1 39     | 1 38     |
| +12                              | 1 59      | 1 58      | 1 58      | 1 57     | 1 56     | 1 54     |
| 14                               | 1 79      | 1 78      | 1 77      | 1 76     | 1 75     | 1 7      |
| 16                               | 1         | 2 00      | 1 99      | 1 98     | 1 95     | 1 91     |
| 18                               | 26        | 23        | 2 2       | 21       | 2 18     | 1        |
| 20                               | 2 56      | 2 51      | 51        | 2 48     | 2 45     | 35       |
| +22                              | 91        | 2 85      | 2 84      | 80       | 2 75     | 61       |
| 24                               | 3 29      | 3 1       | 3 19      | 3 14     | 3 08     | 2 91     |
| 26                               | 3 74      | 3 63      | 3 60      | 3 54     | 3 45     | 3 1      |
| 28                               | 4 36      | 4 17      | 4 13      | 4 05     | 3 90     | 3 56     |
| +30                              | 5 37      | 4 96      | 4 93      | 4 75     | 4 52     | 3 99     |

lhl t bl h w tl Sta d dLight f E l p f diff l i t t d i t m f M g t d d t l O d i t (k) F L t t d (k)  
 i t i f t l m l t p l f t l S d l w h l h i t f l y p t l m f m t h O t f t l S t l l t e d l

LXVII

Mean Motion in Light Curve

| Lat  | $\Delta(\gamma)_0$ for 1 | 3<br>$\Delta$<br>00 | 4<br>Lat |
|------|--------------------------|---------------------|----------|
| 0 08 | 00421                    | 26                  | 1 92     |
| 10   | 47                       | 3                   | 90       |
| 12   | 513                      | 21                  | 88       |
| 14   | 55                       | 19                  | 86       |
| 16   | 589                      | 18                  | 84       |
| 18   | 62                       | 16                  | 82       |
| 0 20 | 00654                    | 15                  | 1 80     |
| 22   | 683                      | 14                  | 78       |
| 24   | 711                      | 14                  | 76       |
| 26   | 737                      | 13                  | 74       |
| 28   | 76                       | 1                   | 72       |
| 0 30 | 00785                    | 11                  | 1 70     |
| 32   | 807                      | 11                  | 68       |
| 34   | 829                      | 10                  | 66       |
| 36   | 849                      | 1                   | 64       |
| 38   | 868                      | 10                  | 62       |
| 0 40 | 00887                    | 9                   | 1 60     |
| 42   | 904                      | 9                   | 58       |
| 44   | 91                       | 8                   | 56       |
| 46   | 937                      | 8                   | 54       |
| 48   | 95                       | 8                   | 52       |
| 0 50 | 00967                    | 7                   | 1 50     |
| 52   | 980                      | 7                   | 48       |
| 0 54 | 00993                    | 7                   | 1 46     |

| Lat  | $\Delta(\delta)_0$ for 1 | 3<br>$\Delta$<br>00 | 4<br>Lat |
|------|--------------------------|---------------------|----------|
| 0 54 | 00993                    | 7                   | 1 46     |
| 56   | 1006                     | 6                   | 44       |
| 58   | 1018                     | 6                   | 42       |
| 60   | 1029                     | 5                   | 40       |
| 62   | 1039                     | 5                   | 38       |
| 64   | 1049                     | 5                   | 36       |
| 0 66 | 01058                    | 5                   | 1 34     |
| 68   | 1 67                     | 4                   | 32       |
| 70   | 1075                     | 4                   | 30       |
| 72   | 1083                     | 4                   | 28       |
| 74   | 1090                     | 4                   | 26       |
| 0 76 | 01097                    | 3                   | 1 24     |
| 78   | 1103                     | 3                   | 22       |
| 80   | 1108                     | 3                   | 20       |
| 82   | 1113                     |                     | 18       |
| 84   | 1117                     |                     | 16       |
| 0 86 | 01121                    | 2                   | 1 14     |
| 88   | 11 4                     | 2                   | 12       |
| 90   | 1128                     |                     | 10       |
| 92   | 1130                     | 1                   | 08       |
| 94   | 1132                     | 1                   | 06       |
| 0 96 | 01133                    | 1                   | 1 04     |
| 98   | 1134                     | 0                   | 02       |
| 1 00 | 01134                    | 0                   | 1 00     |

Th E<sub>1</sub> t l f t h s T b l t d b y t h t f T b l LXVIII g l t h m t l f (k) l d t h A g m t i t h L t i t u d t a k f m T b l XXXVII XLII

LXVIII

Equation of Motion

| Var<br>Lat | - 01 00 + 01 | Var<br>Lat |
|------------|--------------|------------|
| 0 1        | + 13 0 - 13  | 1 9        |
| 0 2        | + 10 0 - 10  | 1 8        |
| 0 3        | + 8 0 - 8    | 1 7        |
| 0 4        | + 7 0 - 7    | 1 6        |
| 0 5        | + 7 0 - 7    | 1 5        |
| 0 6        | + 6 0 - 6    | 1 4        |
| 1 0        | + 6 0 - 6    | 1 0        |

Th i t t b p p l d t t l t y f  
 T b l LXVII t h n i t i o o o o T h A g m t  
 t h V i t l d t l L t i t d t k f m  
 T b l XXXIII XLII



# SATELLITE IV



## Approximate Tables

of

Heliocentric and Geocentric Conjunction

# SATELLITE IV

## Approximate Tables of Conjunction

I

Epochs of Conjunction

| 1      | 2                   | 3                              | 4                   | 5                              | 6                   | 7                  | 8                   | 9                 |   |
|--------|---------------------|--------------------------------|---------------------|--------------------------------|---------------------|--------------------|---------------------|-------------------|---|
| Year   | Conjunction         | Variation for 100 <sup>d</sup> | $\alpha$            | Variation for 100 <sup>d</sup> | $\beta$             | $\gamma$           | $\delta$            | $\epsilon$        |   |
| 1850   | <sup>a</sup> 0'4617 | + 1,1                          | <sup>a</sup> 1785'9 | + '03                          | <sup>a</sup> 332'78 | <sup>a</sup> 365'2 | <sup>a</sup> 12'297 | <sup>a</sup> 9'19 | The constant - 0 <sup>d</sup> .3500 has been applied to each entry in column 2.   |
| 1851   | 4'0402              | + 2,1                          | 2154'6              | + '05                          | 302'47              | 3'2                | 13'685              | 10'61             |   |
| *1852  | 7'6191              | + 1,1                          | 2523'4              | + '03                          | 272'17              | 6'6                | 15'074              | 12'03             | The constant - 0 <sup>d</sup> .300 has been applied to each entry in columns 6, 7, 8, 9.  |
| 1853   | 10'1977             | 0,0                            | 2892'0              | '00                            | 241'87              | 9'9                | 16'463              | 13'46             |   |
| 1854   | 13'7758             | + 1,1                          | 3260'6              | + '03                          | 211'57              | 13'2               | 1'161               | 14'88             | For Eclipses the argument $\gamma$ is not wanted.   |
| 1855   | 0'6008              | - 3,2                          | 3612'7              | - '08                          | 164'51              | 365'1              | 2'486               | 16'24             |   |
| *1856  | 4'1778              | 0,0                            | 3980'9              | '00                            | 134'19              | 3'1                | 3'873               | 0'96              | Column 2 corrected by the equations from the following tables, gives Superior Conjunction as required for Eclipses and Occultations. To find Inferior Conjunction for Shadows and Transits, add (or subtract) one half the synodic period, i.e. 8 <sup>d</sup> .3768, to the numbers of columns 2, 4, 6, 7, 8, 9. |
| 1857   | 6'7559              | - 1,1                          | 16'8                | - '03                          | 103'89              | 6'4                | 5'261               | 2'38              |   |
| 1858   | 10'3337             | 0,0                            | 385'3               | '00                            | 73'58               | 9'7                | 6'648               | 3'80              |   |
| 1859   | 13'9118             | + 1,1                          | 753'9               | + '03                          | 43'27               | 13'0               | 8'037               | 5'22              |   |
| *1860  | 0'7368              | + 2,1                          | 1105'8              | + '05                          | 395'10              | 364'9              | 9'363               | 6'57              |   |
| 1861   | 3'3157              | + 3,2                          | 1474'6              | + '08                          | 364'80              | 2'9                | 10'752              | 8'00              |   |
| 1862   | 6'8950              | 0,0                            | 1843'4              | '00                            | 334'50              | 6'2                | 12'141              | 9'42              |   |
| 1863   | 10'4731             | - 3,2                          | 2212'0              | - '08                          | 304'19              | 9'6                | 13'529              | 10'84             |   |
| *1864  | 14'0502             | - 6,4                          | 2580'3              | - '17                          | 273'89              | 12'9               | 14'916              | 12'26             |   |
| 1865   | 16'6261             | - 5,3                          | 2948'3              | - '14                          | 243'57              | 16'2               | 16'301              | 13'67             |   |
| 1866   | 3'4486              | - 9,6                          | 3299'7              | - '25                          | 196'51              | 2'8                | 0'933               | 15'03             |   |
| 1867   | 7'0232              | - 3,2                          | 3667'3              | - '08                          | 166'20              | 6'1                | 2'319               | 16'45             |   |
| *1868  | 10'6003             | 0,0                            | 4035'6              | '00                            | 135'90              | 9'4                | 3'706               | 1'18              |   |
| 1869   | 13'1784             | + 4,2                          | 71'6                | + '11                          | 105'59              | 12'7               | 5'094               | 2'60              |   |
| 1870   | 0'0045              | + 7,4                          | 423'9               | + '19                          | 58'53               | 364'5              | 6'420               | 3'95              |   |
| 1871   | 3'5854              | + 8,4                          | 793'1               | + '22                          | 28'23               | 2'6                | 7'811               | 5'37              |   |
| *1872  | 7'1666              | + 6,4                          | 1162'5              | + '17                          | 396'81              | 5'9                | 9'202               | 6'79              |   |
| 1873   | 9'7472              | + 3,2                          | 1531'7              | + '08                          | 366'51              | 9'2                | 10'592              | 8'22              |   |
| 1874   | 13'3264             | - 1,1                          | 1900'6              | - '03                          | 336'20              | 12'6               | 11'981              | 9'64              |   |
| 1875   | 0'1506              | - 6,4                          | 2252'3              | - '17                          | 289'14              | 364'4              | 13'306              | 11'00             |   |
| *1876  | 3'7264              | - 7,4                          | 2620'3              | - '19                          | 258'83              | 2'4                | 14'692              | 12'41             |   |
| 1877   | 6'3019              | - 7,4                          | 2988'2              | - '19                          | 228'52              | 5'8                | 16'077              | 13'83             |   |
| 1878   | 9'8773              | - 6,3                          | 3356'0              | - '16                          | 198'22              | 9'1                | 0'772               | 15'24             |   |
| 1879   | 13'4532             | - 1,1                          | 3724'0              | - '03                          | 167'91              | 12'4               | 2'158               | 16'67             |   |
| *1880  | 0'2774              | + 3,2                          | 4075'7              | + '08                          | 120'85              | 364'2              | 3'483               | 1'33              |   |
| 1881   | 2'8566              | + 6,3                          | 112'0               | + '16                          | 90'55               | 2'3                | 4'872               | 2'75              |   |
| 1882   | 6'4372              | + 6,3                          | 481'2               | + '16                          | 60'24               | 5'6                | 6'262               | 4'17              |   |
| 1883   | 10'0176             | + 4,2                          | 850'4               | + '11                          | 29'93               | 8'9                | 7'652               | 5'59              |   |
| *1884  | 13'5972             | + 1,1                          | 1219'3              | + '03                          | 398'51              | 12'2               | 9'042               | 7'01              |   |
| 1885   | 16'1758             | - 2,1                          | 1588'0              | - '05                          | 368'21              | 15'6               | 10'430              | 8'43              |   |
| 1886   | 2'9996              | - 4,2                          | 1939'6              | - '11                          | 321'15              | 2'1                | 11'755              | 9'79              |   |
| 1887   | 6'5762              | - 4,2                          | 2307'8              | - '11                          | 290'84              | 5'4                | 13'142              | 11'21             |   |
| *1888  | 10'1528             | - 3,2                          | 2676'0              | - '08                          | 260'54              | 8'8                | 14'528              | 12'62             |   |
| 1889   | 12'7298             | - 1,1                          | 3044'3              | - '03                          | 230'23              | 12'1               | 15'915              | 14'04             |   |
| 1890   | 16'3076             | + 3,2                          | 3412'8              | + '08                          | 199'94              | 15'4               | 0'612               | 15'47             |   |
| 1891   | 3'1333              | + 4,2                          | 3764'9              | + '11                          | 152'87              | 2'0                | 1'938               | 0'13              |   |
| *1892  | 6'7130              | + 4,2                          | 4133'9              | + '11                          | 122'56              | 5'3                | 3'328               | 1'55              |   |
| 1893   | 9'2927              | + 4,2                          | 170'2               | + '11                          | 92'25               | 8'6                | 4'718               | 2'97              |   |
| 1894   | 12'8724             | + 2,1                          | 539'2               | + '05                          | 61'95               | 11'9               | 6'108               | 4'39              |   |
| 1895   | 16'4514             | - 1,1                          | 908'0               | - '03                          | 31'65               | 15'2               | 7'497               | 5'82              |   |
| *1896  | 3'2755              | - 2,1                          | 1259'7              | - '05                          | 383'47              | 1'8                | 8'821               | 7'17              |   |
| 1897   | 5'8529              | - 4,2                          | 1628'1              | - '11                          | 353'16              | 5'1                | 10'208              | 8'59              |   |
| 1898   | 9'4295              | - 3,2                          | 1996'3              | - '08                          | 322'86              | 8'4                | 11'595              | 10'00             |   |
| 1899   | 13'0064             | - 2,1                          | 2364'6              | - '05                          | 292'55              | 11'8               | 12'982              | 11'42             |   |
| 1900   | 16'5838             | + 1,1                          | 2732'9              | + '03                          | 262'24              | 15'1               | 14'369              | 12'84             |   |
| Period | 16'7536             | ...                            | 4332'6              | ...                            | 398'88              | 365'3              | 16'690              | 16'69             |   |

# SATELLITE IV

## Approximate Tables of Conjunction

I continued

Epochs of Conjunction

| Year   | Conjunction | V <sup>a</sup> ation<br>for 100 <sup>d</sup> | $\alpha$              | V <sup>a</sup> ation<br>for 100 <sup>d</sup> | $\beta$              | $\gamma$             | $\delta$               | $\epsilon$            |   |
|--------|-------------|--|-----------------------|--|----------------------|----------------------|------------------------|-----------------------|---|
| 1900   | 16 5838     | + 1 1  | <sup>a</sup><br>273 9 | + 03   | <sup>a</sup><br>6 24 | <sup>a</sup><br>15 1 | <sup>a</sup><br>14 369 | <sup>a</sup><br>12 84 | The constant $-0^d 3500$<br>has been applied to<br>each entry in column<br>2  |
| 1901   | 3 4088      | + 3 2  | 3084 9                | + 08   | 215 18               | 1 6                  | 15 694                 | 14 0                  |   |
| 1902   | 6 9881      | + 2 1  | 3453 7                | + 05   | 184 88               | 5 0                  | 0 393                  | 15 6                  |   |
| 1903   | 10 5671     | 0 0  | 38 5                  | 00   | 154 57               | 8 3                  | 1 78                   | 35                    |   |
| 1904   | 14 1452     | - 1 1  | 4191 1                | - 03   | 1 4 27               | 11 6                 | 3 170                  | 1 77                  |   |
| 1905   | 16 7 3      | - 2 1  | 227 0                 | - 05   | 93 96                | 14 9                 | 4 558                  | 3 19                  | The constant $-0^d 3 0$<br>has been applied to<br>each entry in columns<br>6 7 8 9  |
| 1906   | 3 5467      | - 1  | 578 6                 | - 05   | 46 90                | 1 5                  | 5 882                  | 4 55                  |   |
| 1907   | 7 1241      | - 1 1  | 947 0                 | - 03   | 16 60                | 4 8                  | 7 69                   | 5 97                  |   |
| 1908   | 10 7018     | 0 0  | 1315 5                | 00   | 385 17               | 8 1                  | 8 657                  | 7 38                  |   |
| 1909   | 13 28 0     | 0 0  | 1684 0                | 00   | 354 87               | 11 4                 | 10 045                 | 8 80                  |   |
| 1910   | 0 1046      | + 1  | 2035 9                | + 05   | 307 79               | 363 3                | 11 370                 | 10 16                 | For Eclipses the argu-<br>ment $\gamma$ is not wanted   |
| 1911   | 3 6835      | + 1 1  | 2404 6                | + 3  | 77 50                | 1 3                  | 12 759                 | 11 58                 |   |
| 1912   | 7 621       | + 1 1  | 773 3                 | + 03   | 47 0                 | 4 6                  | 14 147                 | 13 00                 |   |
| 1913   | 9 8406      | 0  | 3142 0                | 00   | 16 89                | 8 0                  | 15 536                 | 14 4                  |   |
| 1914   | 13 4187     | - 1  | 3510 6                | - 05   | 186 59               | 11 3                 | 0 33                   | 15 84                 |   |
| 1915   | 0 4 5       | - 1  | 3862 2                | - 05   | 139 53               | 363 1                | 1 558                  | 0 51                  | Column 2 corrected by<br>the equations from the<br>following tables gives<br>Superior Conjunction<br>as required for Eclipses<br>and Occultations. To<br>find Inferior Conjunction<br>for Shadows and<br>Transits add (or<br>subtract) one half<br>the synodic period<br>i.e. $8^d 13768$ to the<br>numbers of columns<br>2 4 6 7 8 9 |
| 1916   | 3 8199      | - 3 2  | 4 30 6                | - 08   | 109 2                | 1 2                  | 2 945                  | 1 93                  |   |
| 1917   | 6 3969      | 0 0  | 266                   | 00   | 78 92                | 4 5                  | 4 332                  | 3 35                  |   |
| 1918   | 9 9751      | + 1 1  | 634 8                 | + 03   | 48 61                | 7 8                  | 5 72                   | 4 76                  |   |
| 1919   | 13 5536     | + 2 1  | 1003 5                | + 05   | 18 30                | 11 1                 | 7 109                  | 6 18                  |   |
| 1920   | 0 3 89      | + 3 2  | 1355 5                | + 08   | 370 13               | 362 9                | 8 435                  | 7 54                  |   |
| 1921   | 9583        | + 4 2  | 1724 4                | + 11   | 339 82               | 1 0                  | 9 824                  | 8 96                  |   |
| 1922   | 6 5379      | - 4 2  | 093 4                 | - 11   | 3 952                | 4 3                  | 11 214                 | 10 38                 |   |
| 1923   | 10 1145     | - 1 1  | 2461 6                | - 03   | 279 21               | 7 6                  | 1 600                  | 11 80                 |   |
| 1924   | 13 69 3     | - 7 4  | 830 0                 | - 19   | 248 91               | 11 0                 | 13 988                 | 13 22                 |   |
| 1925   | 16 677      | - 8 4  | 3197 9                | -  | 18 60                | 14 3                 | 15 373                 | 14 64                 |   |
| 1926   | 3 089       | - 7 4  | 3549 0                | - 19   | 171 54               | 0 8                  | 0 005                  | 15 99                 |   |
| 1927   | 6 6647      | - 3 2  | 3916 8                | - 08   | 141 22               | 4                    | 1 390                  | 0 72                  |   |
| 1928   | 10 416      | + 1 1  | 4 85 1                | + 03   | 110 9                | 7 5                  | 2 777                  | 13                    |   |
| 1929   | 1 8 02      | + 6 3  | 3 12                  | + 16   | 80 61                | 10 8                 | 4 165                  | 3 55                  |   |
| 1930   | 16 4006     | + 7 4  | 690 4                 | + 19   | 50 30                | 14 1                 | 5 556                  | 4 97                  |   |
| 1931   | 3 80        | + 7 4  | 104 9                 | + 19   | 3 6                  | 0 7                  | 6 883                  | 6 34                  |   |
| *1932  | 6 8088      | + 6 3  | 1412 2                | + 16   | 371 84               | 4 0                  | 8 274                  | 7 76                  |   |
| 1933   | 9 3893      | + 2 1  | 1781 3                | + 05   | 341 53               | 7 3                  | 9 664                  | 9 18                  |   |
| 1934   | 1 068       | - 2 1  | 2150 1                | - 05   | 311 22               | 10 6                 | 11 053                 | 10 60                 |   |
| 1935   | 16 5456     | - 6 3  | 518 5                 | - 16   | 280 9                | 14 0                 | 12 440                 | 12 01                 |   |
| 1936   | 3 3679      | - 8 4  | 869 7                 | - 21   | 233 86               | 0 5                  | 13 763                 | 13 37                 |   |
| 1937   | 5 94 9      | - 8 4  | 3 37 5                | - 1  | 03 55                | 3 8                  | 15 148                 | 14 79                 |   |
| 1938   | 9 5179      | - 4 2  | 3605 3                | - 11   | 173 25               | 7 2                  | 16 533                 | 16 20                 |   |
| 1939   | 13 0945     | - 1 1  | 3973 4                | - 03   | 142 94               | 10 5                 | 1 29                   | 0 93                  |   |
| 1940   | 16 6723     | + 4 2  | 9 3                   | + 11   | 112 63               | 13 8                 | 617                    | 2 35                  |   |
| 1941   | 4984        | + 6 3  | 361 5                 | + 16   | 65 57                | 0 4                  | 3 944                  | 3 71                  |   |
| 1942   | 6 0789      | + 5 3  | 730 7                 | + 14   | 35 27                | 3 7                  | 5 334                  | 5 14                  |   |
| 1943   | 9 6589      | + 3 2  | 1099 8                | + 08   | 4 97                 | 7                    | 6 723                  | 6 56                  |   |
| 1944   | 13 383      | 0  | 1468 7                | 00   | 373 54               | 10 3                 | 8 113                  | 7 98                  |   |
| 1945   | 15 8164     | - 2 1  | 1837 3                | - 5  | 343 24               | 13 6                 | 9 501                  | 9 40                  |   |
| 1946   | 6401        | - 4  | 2188 9                | - 11   | 296 18               | 0 2                  | 10 8 5                 | 10 75                 |   |
| 1947   | 6 168       | - 3 2  | 2557 1                | - 08   | 265 87               | 3 5                  | 12 213                 | 12 17                 |   |
| 1948   | 9 7938      | - 1  | 2925 3                | - 05   | 235 56               | 6 8                  | 13 599                 | 13 58                 |   |
| 1949   | 12 3711     | 0 0  | 3 93 7                | 00   | 205 25               | 10 2                 | 14 987                 | 15 00                 |   |
| 1950   | 15 9493     | + 3 2  | 3662 3                | + 08   | 174 95               | 13 5                 | 16 375                 | 16 42                 |   |
| Period | 16 7536     |  | 4332 6                |  | 398 88               | 365 3                | 16 690                 | 16 69                 |   |



# SATELLITE IV

## Approximate Tables of Conjunction

*I continued*

**Epochs of Conjunction**

| 1            | 2            | 3                              | 4            | 5                              | 6            | 7            | 8            | 9            |  |
|--------------|--------------|--------------------------------|--------------|--------------------------------|--------------|--------------|--------------|--------------|--|
| Year         | Conjunction  | Variation for 100 <sup>d</sup> | $\alpha$     | Variation for 100 <sup>d</sup> | $\beta$      | $\gamma$     | $\delta$     | $\epsilon$   |  |
|              | <sup>d</sup> |                                | <sup>d</sup> |                                | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |  |
| <b>1950</b>  | 15'9493      | + 3,2                          | 3662'3       | + '08                          | 174'95       | 13'5         | 16'375       | 16'42        | The constant $-0^d.3500$ has been applied to each entry in column 2.   |
| <b>1951</b>  | 2'7751       | + 3,2                          | 4014'4       | + '08                          | 127'90       | 0'0          | 1'010        | 1'10         |  |
| <b>*1952</b> | 6'3544       | + 4,2                          | 50'7         | + '11                          | 97'59        | 3'4          | 2'399        | 2'52         | The constant $-0^d.300$ has been applied to each entry in columns 6, 7, 8, 9.  |
| <b>1953</b>  | 8'9340       | + 2,1                          | 419'7        | + '05                          | 67'28        | 6'7          | 3'790        | 3'94         |  |
| <b>1954</b>  | 12'5130      | + 1,1                          | 788'5        | + '03                          | 36'98        | 10'0         | 5'178        | 5'36         | For Eclipses the argument $\gamma$ is not wanted.  |
| <b>1955</b>  | 16'0915      | - 1,1                          | 1157'1       | - '03                          | 6'67         | 13'3         | 6'567        | 6'78         |  |
| <b>*1956</b> | 2'9157       | - 2,1                          | 1508'9       | - '05                          | 358'50       | 365'2        | 7'891        | 8'13         | Column 2 corrected by the equations from the following tables, gives Superior Conjunction as required for Eclipses and Occultations. To find Inferior Conjunction for Shadows and Transits, add (or subtract) one half the synodic period, i.e. $8^d.3768$ , to the numbers of columns 2, 4, 6, 7, 8, 9. |
| <b>1957</b>  | 5'4931       | - 4,2                          | 1877'2       | - '11                          | 328'19       | 3'2          | 9'279        | 9'55         |  |
| <b>1958</b>  | 9'0697       | - 2,1                          | 2245'4       | - '05                          | 297'89       | 6'5          | 10'665       | 10'97        |  |
| <b>1959</b>  | 12'6471      | 0,0                            | 2613'8       | '00                            | 267'58       | 9'8          | 12'052       | 12'39        |  |
| <b>*1960</b> | 16'2252      | + 2,1                          | 2982'4       | + '05                          | 237'27       | 13'2         | 13'440       | 13'81        |  |
| <b>1961</b>  | 2'0506       | + 2,1                          | 3334'3       | + '05                          | 190'22       | 365'0        | 14'766       | 15'17        |  |
| <b>1962</b>  | 5'6294       | + 1,1                          | 3703'2       | + '03                          | 159'91       | 3'0          | 16'155       | 16'59        |  |
| <b>1963</b>  | 9'2080       | - 1,1                          | 4071'9       | - '03                          | 129'60       | 6'4          | 0'853        | 1'32         |  |
| <b>*1964</b> | 12'7857      | - 2,1                          | 107'8        | - '05                          | 99'30        | 9'7          | 2'241        | 2'74         |  |
| <b>1965</b>  | 15'3632      | - 2,1                          | 476'2        | - '05                          | 68'99        | 13'0         | 3'628        | 4'16         |  |
| <b>1966</b>  | 2'1870       | 0,0                            | 827'8        | '00                            | 21'93        | 364'8        | 4'952        | 5'51         |  |
| <b>1967</b>  | 5'7651       | - 3,2                          | 1196'4       | - '08                          | 390'51       | 2'9          | 6'340        | 6'93         |  |
| <b>*1968</b> | 9'3421       | + 1,1                          | 1564'7       | + '03                          | 360'20       | 6'2          | 7'727        | 8'34         |  |
| <b>1969</b>  | 11'9206      | + 2,1                          | 1933'4       | + '05                          | 329'89       | 9'5          | 9'115        | 9'76         |  |
| <b>1970</b>  | 15'4995      | + 2,1                          | 2302'1       | + '05                          | 299'59       | 12'8         | 10'504       | 11'19        |  |
| <b>1971</b>  | 2'3249       | + 1,1                          | 2654'2       | + '03                          | 252'53       | 364'7        | 11'830       | 12'55        |  |
| <b>*1972</b> | 5'9035       | + 1,1                          | 3022'9       | + '03                          | 222'23       | 2'7          | 13'218       | 13'97        |  |
| <b>1973</b>  | 8'4819       | - 2,1                          | 3391'5       | - '05                          | 191'92       | 6'0          | 14'608       | 15'39        |  |
| <b>1974</b>  | 12'0594      | - 3,2                          | 3759'9       | - '08                          | 161'62       | 9'4          | 15'995       | 0'12         |  |
| <b>1975</b>  | 15'6363      | - 2,1                          | 4128'2       | - '05                          | 131'31       | 12'7         | 0'691        | 1'54         |  |
| <b>*1976</b> | 2'4601       | + 4,2                          | 147'2        | + '11                          | 84'24        | 364'5        | 2'015        | 2'88         |  |
| <b>1977</b>  | 5'0398       | - 7,4                          | 516'2        | - '19                          | 53'95        | 2'6          | 3'405        | 4'31         |  |
| <b>1978</b>  | 8'6153       | + 1,1                          | 884'1        | + '03                          | 23'63        | 5'9          | 4'790        | 5'72         |  |
| <b>1979</b>  | 12'1938      | + 4,2                          | 1252'7       | + '11                          | 392'21       | 9'2          | 6'179        | 7'14         |  |
| <b>*1980</b> | 15'7735      | + 4,2                          | 1621'7       | + '11                          | 361'91       | 12'5         | 7'569        | 8'57         |  |
| <b>1981</b>  | 1'5997       | + 3,2                          | 1973'9       | + '08                          | 314'85       | 364'3        | 8'895        | 9'93         |  |
| <b>1982</b>  | 5'1789       | - 1,1                          | 2342'8       | - '03                          | 284'55       | 2'4          | 10'285       | 11'35        |  |
| <b>1983</b>  | 8'7567       | - 6,3                          | 2711'3       | - '16                          | 254'24       | 5'7          | 11'672       | 12'77        |  |
| <b>*1984</b> | 12'3325      | - 7,4                          | 3079'3       | - '19                          | 223'94       | 9'0          | 13'058       | 14'19        |  |
| <b>1985</b>  | 14'9079      | - 9,5                          | 3447'2       | - '25                          | 193'63       | 12'4         | 14'443       | 15'61        |  |
| <b>1986</b>  | 1'7290       | - 6,3                          | 3798'1       | - '16                          | 146'56       | 364'2        | 15'765       | 0'26         |  |
| <b>1987</b>  | 5'3049       | - 2,1                          | 4166'0       | - '05                          | 116'26       | 2'2          | 0'460        | 1'68         |  |
| <b>*1988</b> | 8'8822       | + 2,1                          | 201'8        | + '05                          | 85'95        | 5'6          | 1'847        | 3'10         |  |
| <b>1989</b>  | 11'4612      | + 5,3                          | 570'6        | + '14                          | 55'64        | 8'8          | 3'236        | 4'52         |  |
| <b>1990</b>  | 15'0412      | + 8,4                          | 939'7        | + '22                          | 25'34        | 12'2         | 4'626        | 5'94         |  |
| <b>1991</b>  | 1'8689       | + 7,4                          | 1292'3       | + '19                          | 377'16       | 364'0        | 5'954        | 7'30         |  |
| <b>*1992</b> | 5'4497       | + 5,3                          | 1661'6       | + '14                          | 346'86       | 2'1          | 7'345        | 8'72         |  |
| <b>1993</b>  | 8'0299       | + 1,1                          | 2030'7       | + '03                          | 316'56       | 5'4          | 8'735        | 10'15        |  |
| <b>1994</b>  | 11'6084      | - 3,2                          | 2399'4       | - '08                          | 286'26       | 8'7          | 10'123       | 11'57        |  |
| <b>1995</b>  | 15'1854      | - 7,4                          | 2767'6       | - '19                          | 255'95       | 12'0         | 11'510       | 12'99        |  |
| <b>*1996</b> | 2'0073       | - 8,4                          | 3118'8       | - '22                          | 208'88       | 363'9        | 12'833       | 14'33        |  |
| <b>1997</b>  | 4'5823       | - 7,4                          | 3486'5       | - '19                          | 178'59       | 1'9          | 14'217       | 15'76        |  |
| <b>1998</b>  | 8'1578       | - 4,2                          | 3854'4       | - '11                          | 148'27       | 5'2          | 15'603       | 0'48         |  |
| <b>1999</b>  | 11'7344      | 0,0                            | 4222'6       | '00                            | 117'96       | 8'6          | 0'299        | 1'90         |  |
| <b>*2000</b> | 15'3124      | ...                            | 258'6        | '00                            | 87'66        | 11'9         | 1'687        | 3'32         |  |
| Period       | 16'7536      | ...                            | 4332'6       | ...                            | 398'88       | 365'3        | 16'690       | 16'69        |  |

# SATELLITE IV

## Approximate Tables of Conjunction

### II Motions of the Arguments

|           |           |         | 3              | 4            | 5            |
|-----------|-----------|---------|----------------|--------------|--------------|
| Syn Rev   | D te      |         | $\beta \gamma$ | $\delta$     | $\epsilon$   |
|           |           |         | <sup>a</sup>   | <sup>a</sup> | <sup>a</sup> |
| <b>1</b>  | Ja ua y   | 16 7536 | 16 75          | 0 063        | 0 06         |
| <b>2</b>  | Februa y  | 5 71    | 33 51          | 1 6          | 13           |
| <b>3</b>  |           | 19 607  | 5 26           | 189          | 19           |
| <b>4</b>  | Ma ch     | 8 014   | 67 01          | 252          | 26           |
| <b>5</b>  |           | 24 7678 | 83 77          | 315          | 32           |
| <b>6</b>  | April     | 10 5 13 | 100 52         | 0 379        | 0 39         |
| <b>7</b>  |           | 27 2749 | 117 27         | 44           | 45           |
| <b>8</b>  | May       | 14 0284 | 134 03         | 505          | 52           |
| <b>9</b>  |           | 30 78 0 | 150 78         | 568          | 58           |
| <b>10</b> | June      | 16 5355 | 167 54         | 631          | 65           |
| <b>11</b> | July      | 3 891   | 184 29         | 0 694        | 0 71         |
| <b>12</b> |           | 0 04 6  | 01 04          | 757          | 77           |
| <b>13</b> | August    | 5 796   | 217 80         | 820          | 84           |
| <b>14</b> |           | 22 5497 | 34 55          | 883          | 90           |
| <b>15</b> | September | 8 3033  | 251 30         | 946          | 97           |
| <b>16</b> |           | 25 0568 | 68 06          | 1 010        | 1 03         |
| <b>17</b> | October   | 11 8104 | 84 81          | 1 073        | 1 10         |
| <b>18</b> |           | 28 5639 | 301 56         | 1 136        | 1 16         |
| <b>19</b> | November  | 14 3175 | 318 32         | 1 199        | 1 23         |
| <b>20</b> | Decembe   | 1 0710  | 335 07         | 1 262        | 1 29         |
| <b>21</b> |           | 17 8 46 | 351 82         | 1 325        | 1 36         |
| <b>22</b> |           | 34 5781 | 368 58         | 1 388        | 1 42         |

I L p Y d i m i l h t d t i C l m by ft F b 8

# SATELLITE IV

## Approximate Tables of Conjunction

III      Equation of Conjunction      Argument  $\alpha$       Ec., Oc., Sh., Tr.

| 1                 | 2                      | 3               | 1                    | 2                      | 3               | 1                    | 2                      | 3               | 1                    | 2                      | 3               | 1                    | 2                      | 3               |
|-------------------|------------------------|-----------------|----------------------|------------------------|-----------------|----------------------|------------------------|-----------------|----------------------|------------------------|-----------------|----------------------|------------------------|-----------------|
| $\alpha$          | Equation               | $\Delta_{10^d}$ | $\alpha$             | Equation               | $\Delta_{10^d}$ | $\alpha$             | Equation               | $\Delta_{10^d}$ | $\alpha$             | Equation               | $\Delta_{10^d}$ | $\alpha$             | Equation               | $\Delta_{10^d}$ |
| <sup>d</sup><br>0 | <sup>d</sup><br>0°3000 | +40             | <sup>d</sup><br>1000 | <sup>d</sup><br>0°5584 | +3              | <sup>d</sup><br>2000 | <sup>d</sup><br>0°3584 | -35             | <sup>d</sup><br>3000 | <sup>d</sup><br>0°0633 | -15             | <sup>d</sup><br>4000 | <sup>d</sup><br>0°1732 | +35             |
| 20                | '3080                  | 40              | 1020                 | '5588                  | +1              | 2020                 | '3514                  | 35              | 3020                 | 604                    | 14              | 4020                 | '1802                  | 35              |
| 40                | '3160                  | 40              | 1040                 | '5589                  | 0               | 2040                 | '3445                  | 35              | 3040                 | 577                    | 13              | 4040                 | '1873                  | 36              |
| 60                | '3239                  | 40              | 1060                 | '5588                  | -1              | 2060                 | '3375                  | 35              | 3060                 | 552                    | 12              | 4060                 | '1944                  | 36              |
| 80                | '3319                  | 40              | 1080                 | '5585                  | 2               | 2080                 | '3305                  | 35              | 3080                 | 529                    | 11              | 4080                 | '2018                  | 37              |
| 100               | '3398                  | 39              | 1100                 | '5580                  | 3               | 2100                 | '3234                  | 35              | 3100                 | 508                    | 10              | 4100                 | '2092                  | 37              |
| 120               | 0°3476                 | +39             | 1120                 | 0°5572                 | -4              | 2120                 | 0°3164                 | -35             | 3120                 | 0°0489                 | -9              | 4120                 | 0°2167                 | +38             |
| 140               | '3555                  | 39              | 1140                 | '5563                  | 5               | 2140                 | '3093                  | 36              | 3140                 | 472                    | 8               | 4140                 | '2243                  | 38              |
| 160               | '3632                  | 39              | 1160                 | '5551                  | 6               | 2160                 | '3022                  | 35              | 3160                 | 457                    | 7               | 4160                 | '2319                  | 39              |
| 180               | '3709                  | 38              | 1180                 | '5538                  | 7               | 2180                 | '2952                  | 35              | 3180                 | 444                    | 6               | 4180                 | '2397                  | 39              |
| 200               | '3785                  | 38              | 1200                 | '5522                  | 9               | 2200                 | '2881                  | 36              | 3200                 | 434                    | 5               | 4200                 | '2474                  | 39              |
| 220               | 0°3861                 | +38             | 1220                 | 0°5504                 | -10             | 2220                 | 0°2810                 | -35             | 3220                 | 0°0425                 | -4              | 4220                 | 0°2553                 | +39             |
| 240               | '3935                  | 37              | 1240                 | '5484                  | 11              | 2240                 | '2740                  | 35              | 3240                 | 418                    | 3               | 4240                 | '2631                  | 39              |
| 260               | '4009                  | 37              | 1260                 | '5462                  | 12              | 2260                 | '2669                  | 35              | 3260                 | 414                    | 2               | 4260                 | '2711                  | 40              |
| 280               | '4082                  | 37              | 1280                 | '5438                  | 12              | 2280                 | '2599                  | 35              | 3280                 | 411                    | -1              | 4280                 | '2790                  | 40              |
| 300               | '4154                  | 36              | 1300                 | '5413                  | 13              | 2300                 | '2529                  | 35              | 3300                 | 411                    | +1              | 4300                 | '2870                  | 40              |
| 320               | 0°4224                 | +35             | 1320                 | 0°5385                 | -14             | 2320                 | 0°2460                 | -35             | 3320                 | 0°0413                 | +2              | 4320                 | 0°2950                 | +40             |
| 340               | '4293                  | 34              | 1340                 | '5356                  | 15              | 2340                 | '2391                  | 35              | 3340                 | 418                    | 3               | 4340                 | '3030                  | 40              |
| 360               | '4361                  | 34              | 1360                 | '5325                  | 16              | 2360                 | '2322                  | 34              | 3360                 | 424                    | 4               | 4360                 | '3110                  | 40              |
| 380               | '4428                  | 33              | 1380                 | '5291                  | 17              | 2380                 | '2254                  | 34              | 3380                 | 433                    | 5               | 4380                 | '3190                  | 40              |
| 400               | '4493                  | 32              | 1400                 | '5257                  | 18              | 2400                 | '2186                  | 34              | 3400                 | 444                    | 6               | 4400                 | '3269                  | 40              |
| 420               | 0°4557                 | +32             | 1420                 | 0°5220                 | -19             | 2420                 | 0°2119                 | -34             | 3420                 | 0°0457                 | +7              | 4420                 | 0°3349                 | +40             |
| 440               | '4619                  | 31              | 1440                 | '5182                  | 20              | 2440                 | '2052                  | 33              | 3440                 | 472                    | 8               | 4440                 | '3427                  | 39              |
| 460               | '4680                  | 30              | 1460                 | '5142                  | 21              | 2460                 | '1987                  | 33              | 3460                 | 490                    | 9               | 4460                 | '3505                  | 39              |
| 480               | '4739                  | 29              | 1480                 | '5100                  | 21              | 2480                 | '1922                  | 33              | 3480                 | 509                    | 10              | 4480                 | '3584                  | 39              |
| 500               | '4796                  | 28              | 1500                 | '5057                  | 22              | 2500                 | '1857                  | 32              | 3500                 | 531                    | 12              | 4500                 | '3661                  | 38              |
| 520               | 0°4852                 | +28             | 1520                 | 0°5012                 | -23             | 2520                 | 0°1794                 | -32             | 3520                 | 0°0556                 | +13             | 4520                 | 0°3737                 | +38             |
| 540               | '4906                  | 27              | 1540                 | '4966                  | 24              | 2540                 | '1731                  | 31              | 3540                 | 582                    | 14              | 4540                 | '3813                  | 38              |
| 560               | '4958                  | 26              | 1560                 | '4918                  | 24              | 2560                 | '1669                  | 31              | 3560                 | 610                    | 15              | 4560                 | '3889                  | 37              |
| 580               | '5008                  | 25              | 1580                 | '4869                  | 25              | 2580                 | '1609                  | 30              | 3580                 | 641                    | 16              | 4580                 | '3962                  | 37              |
| 600               | '5056                  | 24              | 1600                 | '4818                  | 26              | 2600                 | '1549                  | 30              | 3600                 | 674                    | 17              | 4600                 | '4036                  | 37              |
| 620               | 0°5103                 | +23             | 1620                 | 0°4766                 | -26             | 2620                 | 0°1490                 | -29             | 3620                 | 0°0709                 | +18             | 4620                 | 0°4109                 | +36             |
| 640               | '5147                  | 22              | 1640                 | '4713                  | 27              | 2640                 | '1433                  | 29              | 3640                 | 746                    | 19              | 4640                 | '4180                  | 35              |
| 660               | '5190                  | 21              | 1660                 | '4659                  | 28              | 2660                 | '1376                  | 28              | 3660                 | 785                    | 20              | 4660                 | '4250                  | 35              |
| 680               | '5230                  | 20              | 1680                 | '4603                  | 28              | 2680                 | '1321                  | 27              | 3680                 | 826                    | 21              | 4680                 | '4318                  | 34              |
| 700               | '5268                  | 19              | 1700                 | '4546                  | 29              | 2700                 | '1267                  | 27              | 3700                 | 869                    | 22              | 4700                 | '4386                  | 34              |
| 720               | 0°5305                 | +18             | 1720                 | 0°4488                 | -29             | 2720                 | 0°1214                 | -26             | 3720                 | 0°0914                 | +23             | 4720                 | 0°4452                 | +33             |
| 740               | '5339                  | 17              | 1740                 | '4429                  | 30              | 2740                 | '1163                  | 25              | 3740                 | '0961                  | 24              | 4740                 | '4517                  | 32              |
| 760               | '5371                  | 16              | 1760                 | '4369                  | 30              | 2760                 | '1113                  | 25              | 3760                 | '1010                  | 25              | 4760                 | '4581                  | 31              |
| 780               | '5401                  | 14              | 1780                 | '4308                  | 31              | 2780                 | '1064                  | 24              | 3780                 | '1061                  | 26              | 4780                 | '4642                  | 30              |
| 800               | '5428                  | 13              | 1800                 | '4246                  | 31              | 2800                 | '1017                  | 23              | 3800                 | '1114                  | 27              | 4800                 | '4702                  | 30              |
| 820               | 0°5454                 | +12             | 1820                 | 0°4183                 | -32             | 2820                 | 0°0971                 | -23             | 3820                 | 0°1168                 | +28             | 4820                 | 0°4760                 | +29             |
| 840               | '5477                  | 11              | 1840                 | '4119                  | 32              | 2840                 | 927                    | 22              | 3840                 | '1225                  | 29              | 4840                 | '4818                  | 28              |
| 860               | '5498                  | 10              | 1860                 | '4054                  | 33              | 2860                 | 884                    | 21              | 3860                 | '1283                  | 30              | 4860                 | '4873                  | 27              |
| 880               | '5517                  | 9               | 1880                 | '3989                  | 33              | 2880                 | 843                    | 20              | 3880                 | '1343                  | 30              | 4880                 | '4926                  | 26              |
| 900               | '5534                  | 8               | 1900                 | '3923                  | 33              | 2900                 | 804                    | 19              | 3900                 | '1404                  | 31              | 4900                 | '4977                  | 25              |
| 920               | 0°5548                 | +7              | 1920                 | 0°3856                 | -34             | 2920                 | 0°0766                 | -19             | 3920                 | 0°1467                 | +32             | 4920                 | 0°5027                 | +24             |
| 940               | '5561                  | 6               | 1940                 | '3789                  | 34              | 2940                 | 730                    | 18              | 3940                 | '1531                  | 33              | 4940                 | '5074                  | 23              |
| 960               | '5571                  | 5               | 1960                 | '3721                  | 34              | 2960                 | 696                    | 17              | 3960                 | '1597                  | 33              | 4960                 | '5120                  | 22              |
| 980               | '5579                  | 3               | 1980                 | '3653                  | 34              | 2980                 | 664                    | 16              | 3980                 | '1664                  | 34              | 4980                 | '5163                  | 22              |
| 1000              | 0°5584                 | +3              | 2000                 | 0°3584                 | -35             | 3000                 | 0°0633                 | -15             | 4000                 | 0°1732                 | +35             | 5000                 | 0°5206                 | +21             |

The Equation of this Table to be added to the entries of columns 2, 6, 7, 8, 9 of Table I.

Applied Constant:  $+0^{\circ}3000$ .

# SATELLITE IV

## Approximate Tables of Conjunction

IV      Equation of Geocentric Conjunction      Argument  $\beta$       Oc, Tr

| $\beta$           | Equatio | $\Delta$ | $\beta$ | Equation | $\Delta_d$ | $\beta$ | Equation | $\Delta_{rd}$ | $\beta$             | Equatio | $\Delta_{rd}$ |
|-------------------|---------|----------|---------|----------|------------|---------|----------|---------------|---------------------|---------|---------------|
| <sup>d</sup><br>0 | -0 00   | -1       | 100     | -0 6059  | + 15       | 200     | -0 96    | + 68          | <sup>d</sup><br>300 | +0 4075 | + 14          |
| 2                 | 1 00    | 100      | 102     | 60 8     | 17         | 202     | 8 6      | 68            | 302                 | 41 0    | 11            |
| 4                 | 14 0    | 100      | 104     | 5992     | 19         | 204     | 691      | 68            | 304                 | 4120    | 9             |
| 6                 | 1599    | 99       | 106     | 5951     | 1          | 206     | 556      | 67            | 306                 | 4135    | 7             |
| 8                 | 1796    | 98       | 108     | 59 7     | 3          | 208     | 4        | 67            | 308                 | 4146    | 4             |
| 10                | 199     | 98       | 110     | 5859     | 25         | 210     | 87       | 68            | 310                 | 4151    | + 1           |
| 12                | -0 186  | - 97     | 112     | -0 5806  | + 8        | 212     | -0 015   | + 68          | 312                 | +0 4151 | - 1           |
| 14                | 379     | 96       | 114     | 5749     | 30         | 214     | - 17     | 67            | 314                 | 4146    | 4             |
| 16                | 569     | 94       | 116     | 5688     | 32         | 216     | + 116    | 67            | 316                 | 4137    | 6             |
| 18                | 756     | 93       | 118     | 5623     | 33         | 218     | 249      | 66            | 318                 | 4121    | 9             |
| 20                | 294     | 91       | 120     | 5556     | 35         | 220     | 381      | 66            | 320                 | 4100    | 12            |
| 22                | -0 31 0 | - 9      | 122     | -0 5485  | + 37       | 222     | +0 051   | + 65          | 322                 | +0 4075 | - 14          |
| 24                | 3 98    | 88       | 124     | 5411     | 38         | 224     | 64       | 65            | 324                 | 4043    | 17            |
| 26                | 3471    | 86       | 126     | 533      | 40         | 226     | 77       | 65            | 326                 | 4006    | 20            |
| 28                | 3640    | 84       | 128     | 5 5      | 4          | 228     | 901      | 64            | 328                 | 3964    | 23            |
| 30                | 3805    | 81       | 130     | 5165     | 43         | 230     | 10 9     | 64            | 330                 | 3914    | 26            |
| 32                | -0 3964 | - 79     | 132     | -0 5077  | + 45       | 232     | +0 1156  | + 63          | 332                 | +0 3861 | - 29          |
| 34                | 4119    | 76       | 134     | 4987     | 46         | 234     | 1281     | 62            | 334                 | 3800    | 32            |
| 36                | 4269    | 74       | 136     | 4893     | 47         | 236     | 1405     | 6             | 336                 | 3734    | 35            |
| 38                | 4413    | 71       | 138     | 4798     | 49         | 238     | 1528     | 61            | 338                 | 3661    | 38            |
| 40                | 4553    | 68       | 140     | 4698     | 51         | 240     | 1649     | 60            | 340                 | 3584    | 40            |
| 42                | -0 4686 | - 65     | 142     | -0 4595  | + 52       | 242     | +0 1768  | + 59          | 342                 | +0 3500 | - 44          |
| 44                | 4814    | 63       | 144     | 4491     | 53         | 244     | 1885     | 58            | 344                 | 3410    | 47            |
| 46                | 4937    | 60       | 146     | 4384     | 54         | 246     | 01       | 58            | 346                 | 3313    | 50            |
| 48                | 5 54    | 57       | 148     | 4 76     | 55         | 248     | 115      | 57            | 348                 | 3 11    | 53            |
| 50                | 5165    | 54       | 150     | 4165     | 56         | 250     | 2 7      | 56            | 350                 | 3103    | 55            |
| 52                | -0 5 69 | - 51     | 152     | -0 405   | + 57       | 252     | +0 2338  | + 55          | 352                 | +0 2990 | - 58          |
| 54                | 5368    | 48       | 154     | 3937     | 58         | 254     | 445      | 53            | 354                 | 870     | 62            |
| 56                | 5460    | 45       | 156     | 38 0     | 59         | 256     | 550      | 52            | 356                 | 2744    | 65            |
| 58                | 5548    | 4        | 158     | 3702     | 60         | 258     | 2654     | 51            | 358                 | 2612    | 67            |
| 60                | 5628    | 39       | 160     | 3581     | 61         | 260     | 2754     | 50            | 360                 | 2476    | 70            |
| 62                | -0 570  | - 36     | 162     | -0 3459  | + 6        | 262     | +0 285   | + 48          | 362                 | +0 334  | - 72          |
| 64                | 5772    | 33       | 164     | 3335     | 6          | 264     | 946      | 47            | 364                 | 2187    | 75            |
| 66                | 5834    | 30       | 166     | 3 11     | 6          | 266     | 3038     | 46            | 366                 | 033     | 78            |
| 68                | 5891    | 27       | 168     | 3086     | 63         | 268     | 31 8     | 44            | 368                 | 1876    | 80            |
| 70                | 594     | 4        | 170     | 2958     | 64         | 270     | 3 13     | 4             | 370                 | 1713    | 83            |
| 72                | -0 5988 | - 2      | 172     | -0 28 9  | + 65       | 272     | +0 3297  | + 41          | 372                 | +0 1546 | - 85          |
| 74                | 60 8    | 18       | 174     | 7        | 65         | 274     | 3377     | 39            | 374                 | 1375    | 87            |
| 76                | 6061    | 16       | 176     | 2570     | 65         | 276     | 3453     | 37            | 376                 | 1 00    | 88            |
| 78                | 6090    | 13       | 178     | 2439     | 66         | 278     | 3526     | 36            | 378                 | 1022    | 91            |
| 80                | 611     | 10       | 180     | 2307     | 66         | 280     | 3595     | 34            | 380                 | 0838    | 93            |
| 82                | -0 6130 | - 8      | 182     | 0 2174   | + 67       | 282     | +0 3660  | + 32          | 382                 | +0 0652 | - 94          |
| 84                | 614     | 5        | 184     | 2041     | 67         | 284     | 3723     | 31            | 384                 | 463     | 95            |
| 86                | 6149    | 3        | 186     | 1908     | 67         | 286     | 3782     | 28            | 386                 | 272     | 97            |
| 88                | 615     | 0        | 188     | 1774     | 67         | 288     | 3835     | 26            | 388                 | + 77    | 98            |
| 90                | 6148    | + 3      | 190     | 1639     | 68         | 290     | 3886     | 24            | 390                 | - 117   | 98            |
| 92                | -0 614  | + 5      | 192     | -0 1504  | + 68       | 292     | +0 3932  | + 2           | 392                 | -0 0314 | - 99          |
| 94                | 61 7    | 8        | 194     | 1368     | 68         | 294     | 3975     | 20            | 394                 | 512     | 99            |
| 96                | 6110    | 10       | 196     | 1 33     | 68         | 296     | 4012     | 18            | 396                 | 711     | 100           |
| 98                | 6086    | 13       | 198     | 1 98     | 68         | 298     | 4046     | 16            | 398                 | 912     | 100           |
| 100               | -0 6059 | + 15     | 200     | -0 0962  | + 68       | 300     | +0 4075  | + 14          | 400                 | -0 1113 | -100          |

Appl dC tant oo Th Eq t fthi T bl t d by th fT bl V VI gi th A IP II p whi l m t b ppl d f O lt ti  
d T it to th t fth Cl 8 9 fT bl I dwhi h l g m to fT bl LXI f mp ti gth ff t fJ pter ph

# SATELLITE IV

## Approximate Tables of Conjunction

| V                   | Equation of Geocentric Conjunction |      |      |      |      |      |      |      |     |     |      |      |      |      |      | Arguments $\alpha, \beta$ |      |      |      |      | Occ., Tr. |
|---------------------|------------------------------------|------|------|------|------|------|------|------|-----|-----|------|------|------|------|------|---------------------------|------|------|------|------|-----------|
| $\beta$<br>$\alpha$ | 0°                                 | 10°  | 20°  | 30°  | 40°  | 50°  | 60°  | 70°  | 80° | 90° | 100° | 110° | 120° | 130° | 140° | 150°                      | 160° | 170° | 180° | 190° | 200°      |
| 0                   | 700                                | 643  | 587  | 538  | 490  | 463  | 439  | 426  | 424 | 431 | 445  | 465  | 491  | 518  | 547  | 576                       | 605  | 640  | 655  | 679  | 701       |
| 100                 | 784                                | 726  | 666  | 611  | 559  | 516  | 479  | 453  | 437 | 432 | 433  | 443  | 460  | 479  | 503  | 527                       | 552  | 576  | 599  | 621  | 644       |
| 200                 | 867                                | 810  | 748  | 686  | 627  | 572  | 525  | 486  | 457 | 438 | 428  | 426  | 434  | 446  | 462  | 481                       | 501  | 521  | 544  | 566  | 587       |
| 300                 | 947                                | 890  | 827  | 760  | 695  | 631  | 573  | 524  | 481 | 450 | 428  | 416  | 413  | 417  | 427  | 440                       | 457  | 474  | 493  | 512  | 531       |
| 400                 | 1021                               | 968  | 904  | 835  | 763  | 692  | 624  | 563  | 510 | 467 | 434  | 411  | 398  | 394  | 397  | 404                       | 417  | 430  | 446  | 463  | 482       |
| 500                 | 1089                               | 1039 | 976  | 906  | 830  | 753  | 677  | 606  | 543 | 489 | 446  | 412  | 391  | 378  | 373  | 375                       | 382  | 392  | 404  | 420  | 436       |
| 600                 | 1148                               | 1103 | 1043 | 973  | 895  | 813  | 730  | 652  | 579 | 516 | 462  | 42   | 359  | 307  | 27   | 351                       | 354  | 360  | 370  | 381  | 395       |
| 700                 | 1198                               | 1159 | 1103 | 1034 | 955  | 871  | 783  | 698  | 618 | 546 | 485  | 431  | 394  | 365  | 34   | 312                       | 311  | 316  | 321  | 33   | 361       |
| 800                 | 1237                               | 1205 | 1154 | 1088 | 1010 | 924  | 834  | 744  | 659 | 580 | 511  | 452  | 415  | 376  | 345  | 31                        | 311  | 319  | 320  | 326  | 333       |
| 900                 | 1266                               | 1241 | 1196 | 1134 | 1058 | 974  | 882  | 789  | 699 | 616 | 541  | 476  | 423  | 384  | 351  | 310                       | 316  | 310  | 318  | 321  | 324       |
| 1000                | 1282                               | 1264 | 1225 | 1170 | 1099 | 1017 | 926  | 833  | 741 | 651 | 574  | 504  | 446  | 399  | 364  | 318                       | 319  | 309  | 314  | 301  | 311       |
| 1100                | 1286                               | 1277 | 1246 | 1197 | 1132 | 1053 | 965  | 874  | 781 | 693 | 611  | 537  | 475  | 424  | 384  | 351                       | 310  | 317  | 307  | 312  | 310       |
| 1200                | 1278                               | 1277 | 1255 | 1213 | 1155 | 1081 | 999  | 911  | 821 | 732 | 649  | 573  | 509  | 454  | 410  | 376                       | 319  | 312  | 319  | 311  | 315       |
| 1300                | 1257                               | 1265 | 1252 | 1219 | 1169 | 1103 | 1027 | 941  | 857 | 770 | 688  | 613  | 546  | 490  | 443  | 405                       | 375  | 335  | 339  | 327  | 339       |
| 1400                | 1225                               | 1241 | 1237 | 1214 | 1173 | 1116 | 1048 | 971  | 889 | 807 | 728  | 653  | 587  | 529  | 481  | 441                       | 400  | 355  | 367  | 352  | 341       |
| 1500                | 1183                               | 1206 | 1212 | 1198 | 1167 | 1121 | 1061 | 993  | 919 | 843 | 767  | 695  | 630  | 573  | 523  | 482                       | 448  | 424  | 402  | 384  | 370       |
| 1600                | 1130                               | 1161 | 1175 | 1172 | 1151 | 1116 | 1067 | 1009 | 943 | 871 | 804  | 737  | 664  | 618  | 569  | 528                       | 492  | 475  | 444  | 422  | 406       |
| 1700                | 1067                               | 1104 | 1128 | 1135 | 1126 | 1102 | 1065 | 1018 | 962 | 902 | 840  | 778  | 706  | 666  | 619  | 578                       | 541  | 513  | 479  | 467  | 449       |
| 1800                | 997                                | 1041 | 1073 | 1090 | 1092 | 1081 | 1056 | 1021 | 976 | 926 | 872  | 818  | 764  | 715  | 670  | 630                       | 593  | 565  | 530  | 517  | 496       |
| 1900                | 921                                | 969  | 1009 | 1036 | 1049 | 1050 | 1038 | 1016 | 985 | 945 | 901  | 854  | 808  | 763  | 721  | 683                       | 648  | 620  | 584  | 570  | 548       |
| 2000                | 840                                | 893  | 939  | 975  | 1000 | 1013 | 1015 | 1006 | 986 | 958 | 925  | 888  | 848  | 810  | 772  | 736                       | 703  | 676  | 645  | 625  | 603       |
| 2100                | 756                                | 812  | 864  | 908  | 944  | 969  | 984  | 988  | 982 | 967 | 945  | 917  | 887  | 854  | 821  | 790                       | 759  | 731  | 707  | 681  | 660       |
| 2200                | 671                                | 729  | 786  | 838  | 883  | 919  | 948  | 965  | 972 | 969 | 960  | 943  | 921  | 896  | 868  | 841                       | 813  | 789  | 765  | 741  | 718       |
| 2300                | 587                                | 645  | 705  | 763  | 818  | 865  | 905  | 936  | 957 | 967 | 969  | 963  | 949  | 923  | 912  | 889                       | 865  | 843  | 820  | 798  | 776       |
| 2400                | 505                                | 563  | 626  | 689  | 751  | 808  | 860  | 902  | 936 | 959 | 973  | 977  | 974  | 965  | 950  | 933                       | 913  | 894  | 873  | 853  | 831       |
| 2500                | 427                                | 483  | 546  | 614  | 682  | 748  | 810  | 864  | 910 | 944 | 970  | 986  | 992  | 991  | 984  | 972                       | 957  | 941  | 921  | 905  | 885       |
| 2600                | 355                                | 408  | 472  | 541  | 613  | 687  | 758  | 823  | 880 | 926 | 963  | 989  | 1004 | 1012 | 1012 | 1006                      | 996  | 983  | 968  | 952  | 935       |
| 2700                | 291                                | 339  | 401  | 472  | 548  | 627  | 706  | 779  | 846 | 902 | 949  | 986  | 1010 | 1026 | 1031 | 1031                      | 1021 | 1009 | 997  | 984  | 978       |
| 2800                | 234                                | 278  | 336  | 406  | 484  | 567  | 652  | 733  | 808 | 874 | 931  | 976  | 1010 | 1033 | 1047 | 1053                      | 1054 | 1049 | 1041 | 1030 | 1017      |
| 2900                | 187                                | 225  | 278  | 346  | 425  | 511  | 600  | 686  | 768 | 842 | 907  | 960  | 1002 | 1034 | 1054 | 1066                      | 1072 | 1071 | 1067 | 1059 | 1050      |
| 3000                | 152                                | 182  | 231  | 296  | 373  | 459  | 550  | 640  | 727 | 807 | 880  | 940  | 989  | 1027 | 1053 | 1071                      | 1082 | 1085 | 1084 | 1081 | 1074      |
| 3100                | 127                                | 150  | 194  | 253  | 327  | 411  | 503  | 595  | 686 | 771 | 848  | 915  | 970  | 1013 | 1046 | 1069                      | 1084 | 1091 | 1095 | 1094 | 1090      |
| 3200                | 116                                | 130  | 166  | 220  | 290  | 371  | 460  | 553  | 645 | 733 | 814  | 885  | 944  | 993  | 1030 | 1058                      | 1078 | 1089 | 1096 | 1099 | 1099      |
| 3300                | 115                                | 114  | 150  | 197  | 260  | 336  | 423  | 513  | 605 | 694 | 776  | 851  | 914  | 974  | 1008 | 1040                      | 1064 | 1079 | 1089 | 1096 | 1099      |
| 3400                | 128                                | 126  | 145  | 183  | 239  | 309  | 391  | 478  | 567 | 655 | 738  | 814  | 879  | 937  | 979  | 1015                      | 1043 | 1061 | 1075 | 1084 | 1091      |
| 3500                | 152                                | 141  | 151  | 181  | 229  | 291  | 365  | 446  | 532 | 617 | 701  | 774  | 841  | 898  | 945  | 983                       | 1015 | 1036 | 1053 | 1065 | 1075      |
| 3600                | 188                                | 169  | 169  | 191  | 228  | 281  | 347  | 421  | 500 | 581 | 659  | 733  | 799  | 857  | 906  | 946                       | 979  | 1003 | 1022 | 1037 | 1050      |
| 3700                | 235                                | 208  | 200  | 210  | 238  | 280  | 336  | 401  | 472 | 547 | 621  | 691  | 755  | 813  | 862  | 903                       | 938  | 961  | 986  | 1003 | 1019      |
| 3800                | 291                                | 257  | 240  | 240  | 256  | 288  | 332  | 387  | 450 | 516 | 584  | 649  | 711  | 766  | 814  | 856                       | 892  | 919  | 943  | 963  | 980       |
| 3900                | 357                                | 316  | 290  | 280  | 285  | 304  | 337  | 381  | 432 | 490 | 549  | 609  | 665  | 717  | 764  | 805                       | 841  | 869  | 894  | 916  | 935       |
| 4000                | 429                                | 383  | 349  | 328  | 322  | 329  | 349  | 380  | 420 | 467 | 518  | 570  | 621  | 669  | 713  | 752                       | 788  | 816  | 842  | 866  | 887       |
| 4100                | 506                                | 456  | 414  | 384  | 366  | 362  | 368  | 386  | 414 | 450 | 491  | 534  | 579  | 621  | 661  | 700                       | 734  | 761  | 788  | 812  | 834       |
| 4200                | 588                                | 534  | 485  | 447  | 418  | 401  | 395  | 399  | 414 | 438 | 467  | 501  | 538  | 575  | 611  | 646                       | 678  | 705  | 731  | 755  | 778       |
| 4300                | 673                                | 616  | 562  | 515  | 476  | 447  | 428  | 419  | 420 | 432 | 450  | 473  | 501  | 531  | 562  | 593                       | 623  | 648  | 673  | 697  | 720       |
| 4400                | 757                                | 700  | 641  | 587  | 539  | 498  | 466  | 444  | 432 | 431 | 437  | 450  | 469  | 492  | 517  | 542                       | 569  | 593  | 617  | 639  | 663       |
| 4500                | 841                                | 783  | 721  | 661  | 605  | 553  | 509  | 474  | 450 | 435 | 429  | 432  | 441  | 456  | 475  | 496                       | 518  | 539  | 566  | 583  | 606       |

Applied Constant: + 700.

The unit in this Table equals 0.0001.

# SATELLITE IV

## Approximate Tables of Conjunction

V continued

Equation of Geocentric Conjunction

Arguments  $\beta$

Oc, Tr

| $\beta$ | 200 <sup>d</sup> 210 <sup>d</sup> 220 <sup>d</sup> | 230 <sup>d</sup> 240 <sup>d</sup> 250 <sup>d</sup> | 260 <sup>d</sup> 270 <sup>d</sup> 280 <sup>d</sup> | 290 <sup>d</sup> 300 <sup>d</sup> 310 <sup>d</sup> | 320 <sup>d</sup> 330 <sup>d</sup> 340 <sup>d</sup> | 350 <sup>d</sup> 360 <sup>d</sup> 370 <sup>d</sup> | 380 <sup>d</sup> 390 <sup>d</sup> 400 <sup>d</sup> |
|---------|--|--|--|--|--|--|--|
| 0       | 7 1 7 4 747  | 773 799 8 7  | 856 885 913  | 938 957 971  | 976 973 958  | 934 900 857  | 806 751 694  |
| 100     | 644 666 690  | 716 745 776  | 809 844 878  | 912 94 968   | 986 996 995  | 983 961 9 8  | 884 834 778  |
| 200     | 587 609 633  | 660 689 7 3  | 760 799 840  | 88 922 959   | 989 101 1025                                       | 10 6 1 15 993                                      | 958 914 862  |
| 300     | 533 554 578  | 604 634 669  | 709 752 799  | 848 897 944  | 987 10 2 1 48                                      | 1 63 1064 1053                                     | 10 7 989 941                                       |
| 400     | 48 502 5 4   | 551 58 616   | 658 7 4 756  | 811 868 9 5  | 978 10 5 1064                                      | 1091 1105 11 5                                     | 1 89 1059 1016                                     |
| 500     | 436 454 474  | 5 0 530 565  | 608 656 711  | 77 835 901   | 963 10 1 73  | 111 1138 1149                                      | 1143 1121 1084                                     |
| 600     | 395 411 43   | 453 481 516  | 559 609 666  | 730 800 87   | 943 1011 1 73                                      | 1124 1161 1184                                     | 1188 1176 1145                                     |
| 700     | 361 374 391  | 41 438 472   | 514 564 6  | 689 76 840   | 918 995 1065                                       | 11 7 1175 1 08                                     | 1222 1 17 1195                                     |
| 800     | 333 345 358  | 377 401 43   | 47 5 580   | 648 7 4 805  | 888 971 1050                                       | 11 1 1178 12 1                                     | 1245 1250 1235                                     |
| 900     | 314 3 333  | 349 370 398  | 436 483 540  | 607 684 767  | 855 943 10 8                                       | 1106 1172 1 24                                     | 1259 1271 1264                                     |
| 1000    | 303 307 315  | 3 8 346 371  | 405 449 504  | 569 645 729  | 818 908 999  | 1082 1156 1215                                     | 1258 1279 1 81                                     |
| 1100    | 3 0 301 305  | 314 329 35   | 380 420 47   | 534 608 690  | 779 871 964  | 1051 1130 1196                                     | 1246 1276 1 86                                     |
| 1200    | 3 5 303 304  | 310 3 336  | 363 398 444  | 50 57 651  | 737 8 9 9 3  | 101 1096 1167                                      | 1223 1 61 1279                                     |
| 1300    | 319 314 311  | 31 318 331   | 352 381 422  | 474 539 61   | 695 784 877  | 967 1052 1127                                      | 1189 1 33 1259                                     |
| 1400    | 341 33 3 6   | 3 4 3 5 333  | 348 371 406  | 451 509 577  | 654 738 828  | 916 1002 1079                                      | 1144 1195 12 8                                     |
| 1500    | 370 358 349  | 343 340 34   | 351 369 395  | 433 483 543  | 613 691 775  | 861 945 1023                                       | 1091 1145 1186                                     |
| 1600    | 406 392 379  | 369 362 359  | 362 37 391   | 4 0 462 513  | 574 644 722  | 802 883 960  | 1030 1089 1134                                     |
| 1700    | 449 432 417  | 403 39 384   | 381 384 395  | 414 446 486  | 538 598 667  | 740 816 890  | 960 1022 1071                                      |
| 1800    | 496 478 460  | 443 4 8 415  | 405 401 404  | 413 434 465  | 505 554 613  | 679 748 818  | 886 948 100  |
| 1900    | 48 5 8 508   | 488 470 452  | 437 4 5 419  | 419 429 447  | 476 514 56   | 617 679 743  | 808 87 926   |
| 2000    | 603 581 560  | 538 515 494  | 473 455 44   | 431 430 436  | 45 478 514   | 558 610 667  | 728 789 846  |
| 2100    | 660 638 615  | 591 566 540  | 514 489 467  | 448 436 43   | 433 446 469  | 502 543 592  | 647 705 762  |
| 2200    | 718 695 67   | 646 619 590  | 559 5 8 498  | 471 447 430  | 420 419 429  | 449 479 519  | 567 621 677  |
| 2300    | 776 753 7 9  | 7 3 674 642  | 607 57 535   | 498 465 435  | 412 398 395  | 402 42 45  | 490 539 593  |
| 2400    | 832 809 786  | 759 7 9 696  | 657 617 573  | 529 486 446  | 411 384 367  | 361 367 386  | 418 460 511  |
| 2500    | 885 864 841  | 814 784 749  | 709 664 616  | 564 51 462   | 416 376 346  | 3 7 321 329  | 351 387 433  |
| 2600    | 935 915 893  | 867 837 8 1  | 759 712 659  | 602 543 483  | 426 375 33   | 300 283 79   | 29 319 360   |
| 2700    | 978 961 943  | 916 887 85   | 808 760 7 4  | 64 576 509   | 443 382 327  | 284 253 239  | 241 61 95  |
| 2800    | 1017 1002 984                                      | 961 933 899  | 856 807 749  | 683 613 538  | 465 394 329  | 74 33 206  | 00 210 238   |
| 2900    | 1050 1037 10                                       | 1 00 975 94  | 901 851 79   | 725 651 57   | 492 413 339  | 274 3 186  | 168 168 190  |
| 3000    | 1 74 1064 1 51                                     | 1033 1010 980                                      | 940 89 834   | 767 690 608  | 5 3 438 357  | 284 23 178   | 150 14 154   |
| 3100    | 1090 1 85 1075                                     | 1060 1039 101                                      | 975 928 873  | 806 7 9 646  | 557 468 381  | 301 23 178   | 14 125 128   |
| 3200    | 1 99 1095 1089                                     | 1 78 1061 1037                                     | 1 04 961 908                                       | 843 767 684  | 595 504 412  | 3 7 253 190  | 146 1 1 116  |
| 3300    | 1 99 1099 1096                                     | 1088 1075 1 55                                     | 10 7 988 938                                       | 877 8 4 7 3  | 635 543 450  | 361 281 213  | 161 128 115  |
| 3400    | 1091 1094 1095                                     | 1 90 108 1066                                      | 104 10 9 964                                       | 908 840 76   | 676 586 49   | 4 2 318 246  | 187 148 126  |
| 3500    | 1075 1081 1085                                     | 1084 1080 107                                      | 1051 1 3 984                                       | 935 87 8 0   | 719 631 539  | 45 364 288   | 225 178 150  |
| 3600    | 1050 106 1067                                      | 1071 1 71 1 65                                     | 1052 1030 999                                      | 956 901 835  | 760 678 59   | 502 417 340  | 272 220 185  |
| 3700    | 1 19 1031 104                                      | 1049 1053 1053                                     | 1046 1031 1006                                     | 972 9 5 867  | 8 1 725 64   | 559 476 398  | 328 7 231  |
| 3800    | 980 995 10 9                                       | 10 0 1 9 1033                                      | 1033 10 5 1006                                     | 98 944 897   | 838 772 696  | 619 539 463  | 393 333 287  |
| 3900    | 935 953 970  | 983 997 1006                                       | 1 1 1011 1003                                      | 987 958 9 1  | 874 817 751  | 680 606 534  | 465 403 351  |
| 4000    | 887 906 924  | 94 959 973   | 985 99 99  | 985 968 94   | 905 860 804  | 742 675 607  | 540 478 423  |
| 4100    | 834 855 875  | 896 915 935  | 95 966 975   | 977 97 957   | 933 899 854  | 8 3 745 68   | 619 557 500  |
| 4200    | 778 800 8  | 845 868 891  | 914 934 95   | 964 969 967  | 955 934 902  | 862 813 759  | 700 639 582  |
| 4300    | 7 0 743 766  | 791 816 843  | 871 898 9 3  | 945 961 970  | 972 964 945  | 917 879 833  | 78 723 666   |
| 4400    | 663 685 708  | 734 762 793  | 8 4 857 890  | 9 1 948 969  | 983 989 983  | 968 942 905  | 860 807 751  |
| 4500    | 606 6 8 65   | 678 708 740  | 776 813 853  | 892 929 96   | 989 1007 1015                                      | 1 13 998 972                                       | 934 888 834  |

Appli d C t t +700

Th it q l oo

# SATELLITE IV

## Approximate Tables of Conjunction

| VI                  |  | Equation of Geocentric Conjunction |                 |                 |                 |                 |                  |                  |                  |                  | Arguments $\beta, \gamma$ |                  |                  |                  |                  |                  | Oc., Tr.         |                  |                  |                  |                  |                  |
|---------------------|--|------------------------------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|---------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| $\beta$<br>$\gamma$ |  | 0 <sup>d</sup>                     | 20 <sup>d</sup> | 40 <sup>d</sup> | 60 <sup>d</sup> | 80 <sup>d</sup> | 100 <sup>d</sup> | 120 <sup>d</sup> | 140 <sup>d</sup> | 160 <sup>d</sup> | 180 <sup>d</sup>          | 200 <sup>d</sup> | 220 <sup>d</sup> | 240 <sup>d</sup> | 260 <sup>d</sup> | 280 <sup>d</sup> | 300 <sup>d</sup> | 320 <sup>d</sup> | 340 <sup>d</sup> | 360 <sup>d</sup> | 380 <sup>d</sup> | 400 <sup>d</sup> |
| 0                   |  | 300                                | 339             | 370             | 389             | 395             | 388              | 373              | 353              | 334              | 316                       | 300              | 282              | 265              | 246              | 227              | 211              | 205              | 212              | 232              | 264              | 302              |
| 10                  |  | 264                                | 305             | 342             | 372             | 389             | 395              | 385              | 372              | 357              | 340                       | 325              | 307              | 288              | 267              | 241              | 218              | 201              | 197              | 205              | 231              | 266              |
| 20                  |  | 229                                | 271             | 314             | 353             | 380             | 394              | 396              | 389              | 377              | 363                       | 348              | 331              | 312              | 287              | 257              | 227              | 200              | 184              | 183              | 200              | 231              |
| 30                  |  | 196                                | 238             | 286             | 332             | 369             | 393              | 404              | 403              | 395              | 384                       | 370              | 354              | 335              | 308              | 275              | 238              | 202              | 175              | 164              | 172              | 198              |
| 40                  |  | 167                                | 207             | 257             | 310             | 356             | 389              | 408              | 414              | 411              | 402                       | 391              | 376              | 357              | 330              | 293              | 250              | 207              | 170              | 148              | 148              | 168              |
| 50                  |  | 141                                | 179             | 230             | 288             | 341             | 382              | 410              | 421              | 423              | 418                       | 408              | 396              | 378              | 350              | 312              | 264              | 215              | 169              | 138              | 128              | 142              |
| 60                  |  | 121                                | 153             | 205             | 266             | 325             | 374              | 407              | 425              | 432              | 430                       | 423              | 413              | 396              | 369              | 330              | 280              | 225              | 172              | 131              | 114              | 121              |
| 70                  |  | 106                                | 132             | 183             | 245             | 309             | 363              | 402              | 425              | 437              | 439                       | 434              | 426              | 411              | 386              | 347              | 296              | 237              | 178              | 130              | 105              | 106              |
| 80                  |  | 95                                 | 117             | 163             | 226             | 292             | 350              | 394              | 422              | 437              | 443                       | 441              | 435              | 423              | 400              | 363              | 313              | 251              | 188              | 134              | 101              | 95               |
| 90                  |  | 92                                 | 106             | 149             | 209             | 276             | 336              | 383              | 416              | 434              | 443                       | 444              | 441              | 431              | 412              | 377              | 328              | 266              | 201              | 142              | 103              | 92               |
| 100                 |  | 93                                 | 102             | 138             | 194             | 259             | 320              | 370              | 405              | 426              | 439                       | 443              | 443              | 436              | 420              | 389              | 343              | 284              | 218              | 156              | 112              | 93               |
| 110                 |  | 102                                | 103             | 133             | 183             | 244             | 304              | 355              | 392              | 416              | 430                       | 437              | 440              | 437              | 425              | 398              | 357              | 301              | 237              | 174              | 125              | 101              |
| 120                 |  | 116                                | 111             | 132             | 176             | 231             | 287              | 337              | 375              | 401              | 418                       | 427              | 433              | 433              | 425              | 405              | 369              | 318              | 257              | 195              | 145              | 115              |
| 130                 |  | 136                                | 123             | 136             | 172             | 219             | 272              | 319              | 357              | 384              | 402                       | 414              | 422              | 426              | 423              | 408              | 378              | 334              | 279              | 220              | 168              | 135              |
| 140                 |  | 160                                | 141             | 146             | 171             | 211             | 257              | 300              | 337              | 364              | 384                       | 397              | 407              | 415              | 416              | 407              | 386              | 350              | 301              | 247              | 195              | 159              |
| 150                 |  | 188                                | 164             | 160             | 174             | 204             | 243              | 281              | 316              | 342              | 363                       | 377              | 390              | 400              | 406              | 404              | 391              | 364              | 324              | 275              | 225              | 187              |
| 160                 |  | 220                                | 191             | 177             | 182             | 201             | 231              | 264              | 294              | 319              | 340                       | 355              | 369              | 382              | 393              | 398              | 394              | 377              | 345              | 304              | 259              | 219              |
| 170                 |  | 255                                | 220             | 198             | 192             | 201             | 222              | 247              | 273              | 295              | 316                       | 332              | 347              | 363              | 378              | 389              | 393              | 386              | 366              | 332              | 293              | 253              |
| 180                 |  | 291                                | 253             | 223             | 207             | 203             | 214              | 231              | 252              | 272              | 291                       | 307              | 324              | 341              | 360              | 377              | 390              | 394              | 384              | 361              | 327              | 289              |
| 190                 |  | 326                                | 286             | 250             | 221             | 208             | 209              | 218              | 233              | 249              | 267                       | 283              | 300              | 318              | 341              | 363              | 384              | 398              | 400              | 387              | 360              | 325              |
| 200                 |  | 361                                | 320             | 279             | 242             | 217             | 206              | 207              | 215              | 228              | 243                       | 258              | 275              | 294              | 319              | 347              | 376              | 400              | 413              | 411              | 392              | 360              |
| 210                 |  | 394                                | 353             | 307             | 262             | 228             | 207              | 199              | 200              | 209              | 220                       | 235              | 252              | 271              | 298              | 330              | 365              | 399              | 423              | 431              | 420              | 392              |
| 220                 |  | 426                                | 386             | 336             | 284             | 240             | 210              | 193              | 189              | 194              | 202                       | 214              | 229              | 248              | 276              | 312              | 353              | 395              | 429              | 448              | 446              | 424              |
| 230                 |  | 452                                | 415             | 363             | 306             | 254             | 216              | 191              | 181              | 181              | 186                       | 195              | 209              | 227              | 256              | 294              | 339              | 388              | 431              | 460              | 467              | 450              |
| 240                 |  | 474                                | 441             | 389             | 328             | 270             | 224              | 192              | 176              | 170              | 173                       | 180              | 191              | 208              | 236              | 274              | 324              | 379              | 429              | 467              | 483              | 473              |
| 250                 |  | 491                                | 462             | 412             | 349             | 287             | 235              | 197              | 174              | 164              | 163                       | 168              | 177              | 192              | 219              | 256              | 308              | 367              | 424              | 469              | 494              | 490              |
| 260                 |  | 503                                | 479             | 432             | 369             | 304             | 247              | 204              | 177              | 163              | 158                       | 160              | 167              | 180              | 203              | 240              | 292              | 353              | 415              | 468              | 499              | 503              |
| 270                 |  | 510                                | 491             | 447             | 386             | 321             | 251              | 215              | 183              | 165              | 157                       | 158              | 161              | 170              | 191              | 226              | 276              | 338              | 402              | 460              | 498              | 510              |
| 280                 |  | 508                                | 498             | 459             | 402             | 338             | 276              | 227              | 192              | 171              | 160                       | 157              | 158              | 164              | 182              | 214              | 260              | 321              | 387              | 448              | 491              | 508              |
| 290                 |  | 501                                | 498             | 465             | 414             | 353             | 292              | 242              | 202              | 181              | 167                       | 162              | 160              | 162              | 176              | 205              | 246              | 304              | 369              | 431              | 479              | 501              |
| 300                 |  | 488                                | 492             | 468             | 422             | 366             | 308              | 258              | 220              | 195              | 179                       | 170              | 165              | 165              | 174              | 197              | 234              | 287              | 349              | 411              | 461              | 489              |
| 310                 |  | 470                                | 480             | 465             | 428             | 378             | 324              | 276              | 238              | 212              | 193                       | 183              | 175              | 171              | 176              | 193              | 224              | 271              | 327              | 387              | 438              | 471              |
| 320                 |  | 447                                | 464             | 457             | 429             | 387             | 339              | 294              | 258              | 231              | 211                       | 198              | 189              | 182              | 182              | 193              | 215              | 254              | 305              | 360              | 412              | 448              |
| 330                 |  | 420                                | 442             | 445             | 427             | 394             | 353              | 313              | 279              | 253              | 231                       | 217              | 206              | 196              | 191              | 195              | 210              | 240              | 283              | 333              | 383              | 422              |
| 340                 |  | 388                                | 417             | 428             | 420             | 398             | 366              | 331              | 300              | 275              | 254                       | 239              | 225              | 213              | 203              | 200              | 207              | 227              | 261              | 304              | 350              | 390              |
| 350                 |  | 354                                | 388             | 407             | 410             | 399             | 376              | 349              | 321              | 299              | 277                       | 262              | 247              | 232              | 218              | 208              | 207              | 217              | 240              | 275              | 316              | 356              |
| 360                 |  | 319                                | 356             | 383             | 397             | 397             | 384              | 365              | 343              | 322              | 303                       | 287              | 270              | 253              | 235              | 220              | 209              | 208              | 221              | 246              | 282              | 321              |
| 370                 |  | 283                                | 322             | 357             | 381             | 392             | 390              | 379              | 362              | 345              | 327                       | 311              | 294              | 275              | 254              | 233              | 214              | 203              | 204              | 220              | 248              | 285              |
| 380                 |  | 247                                | 288             | 329             | 363             | 385             | 393              | 391              | 380              | 366              | 351                       | 336              | 319              | 299              | 276              | 249              | 221              | 200              | 190              | 195              | 216              | 249              |
| 390                 |  | 214                                | 255             | 301             | 344             | 375             | 393              | 400              | 396              | 385              | 373                       | 359              | 342              | 323              | 297              | 266              | 232              | 200              | 180              | 174              | 187              | 216              |
| 400                 |  | 182                                | 223             | 272             | 322             | 364             | 391              | 406              | 408              | 403              | 393                       | 380              | 365              | 346              | 319              | 284              | 244              | 203              | 173              | 156              | 160              | 184              |

Applied Constant: + 300.

The unit equals 0<sup>d</sup>.0001.

# SATELLITE IV

## Approximate Tables of Conjunction

### Equations of Conjunction

VII

| $\delta$   | Equation | $\Delta$<br>$\sigma_d$ | $\delta$   | Equation | $\Delta$<br>$\sigma_d$ |
|------------|----------|------------------------|------------|----------|------------------------|
| <b>d</b>   |          |                        |            |          |                        |
| <b>00</b>  | 00400    | - 15                   | <b>100</b> | 006 8    | + 12                   |
| <b>2</b>   | 371      | 15                     | <b>2</b>   | 651      | 11                     |
| <b>4</b>   | 341      | 15                     | <b>4</b>   | 673      | 11                     |
| <b>6</b>   | 312      | 14                     | <b>6</b>   | 694      | 10                     |
| <b>8</b>   | 84       | 14                     | <b>8</b>   | 71       | 9                      |
| <b>10</b>  | 256      | 14                     | <b>110</b> | 7 9      | 8                      |
| <b>12</b>  | 0029     | - 13                   | <b>112</b> | 00744    | + 7                    |
| <b>4</b>   | 3        | 13                     | <b>4</b>   | 757      | 6                      |
| <b>6</b>   | 178      | 12                     | <b>6</b>   | 768      | 5                      |
| <b>8</b>   | 155      | 11                     | <b>8</b>   | 777      | 4                      |
| <b>20</b>  | 133      | 11                     | <b>120</b> | 784      | 3                      |
| <b>22</b>  | 0011     | - 10                   | <b>122</b> | 0 788    | + 2                    |
| <b>4</b>   | 93       | 9                      | <b>4</b>   | 791      | + 1                    |
| <b>6</b>   | 76       | 8                      | <b>6</b>   | 791      | - 1                    |
| <b>8</b>   | 60       | 7                      | <b>8</b>   | 789      | 2                      |
| <b>30</b>  | 47       | 6                      | <b>130</b> | 785      | 3                      |
| <b>32</b>  | 00035    | - 5                    | <b>132</b> | 00778    | - 4                    |
| <b>4</b>   | 5        | 4                      | <b>4</b>   | 769      | 5                      |
| <b>6</b>   | 18       | 3                      | <b>6</b>   | 759      | 6                      |
| <b>8</b>   | 13       |                        | <b>8</b>   | 746      | 7                      |
| <b>40</b>  | 10       | - 1                    | <b>140</b> | 731      | 8                      |
| <b>42</b>  | 00009    | 0                      | <b>142</b> | 00715    | - 9                    |
| <b>4</b>   | 11       | + 1                    | <b>4</b>   | 697      | 10                     |
| <b>6</b>   | 14       | 2                      | <b>6</b>   | 677      | 11                     |
| <b>8</b>   | 0        | 3                      | <b>8</b>   | 655      | 11                     |
| <b>50</b>  | 8        | 4                      | <b>150</b> | 632      | 12                     |
| <b>52</b>  | 0038     | + 5                    | <b>152</b> | 0 608    | - 12                   |
| <b>4</b>   | 50       | 7                      | <b>4</b>   | 583      | 13                     |
| <b>6</b>   | 64       | 8                      | <b>6</b>   | 556      | 14                     |
| <b>8</b>   | 80       | 9                      | <b>8</b>   | 5 9      | 14                     |
| <b>60</b>  | 98       | 9                      | <b>160</b> | 501      | 14                     |
| <b>62</b>  | 00117    | + 10                   | <b>162</b> | 0047     | - 15                   |
| <b>4</b>   | 138      | 11                     | <b>4</b>   | 443      | 15                     |
| <b>6</b>   | 161      | 12                     | <b>6</b>   | 413      | 15                     |
| <b>8</b>   | 185      | 1                      | <b>8</b>   | 384      | 15                     |
| <b>70</b>  | 210      | 13                     | <b>170</b> | 355      | 15                     |
| <b>72</b>  | 00237    | + 14                   | <b>172</b> | 003 5    | - 15                   |
| <b>4</b>   | 64       | 14                     | <b>4</b>   | 297      | 14                     |
| <b>6</b>   | 9        | 14                     | <b>6</b>   | 269      | 14                     |
| <b>8</b>   | 32       | 14                     | <b>8</b>   | 41       | 14                     |
| <b>80</b>  | 349      | 15                     | <b>180</b> | 215      | 13                     |
| <b>82</b>  | 00378    | + 15                   | <b>182</b> | 0190     | - 12                   |
| <b>4</b>   | 408      | 15                     | <b>4</b>   | 166      | 12                     |
| <b>6</b>   | 438      | 5                      | <b>6</b>   | 143      | 11                     |
| <b>8</b>   | 467      | 14                     | <b>8</b>   | 121      | 11                     |
| <b>90</b>  | 495      | 14                     | <b>190</b> | 1 1      | 10                     |
| <b>92</b>  | 005 3    | + 14                   | <b>192</b> | 00083    | - 9                    |
| <b>4</b>   | 551      | 14                     | <b>4</b>   | 67       | 8                      |
| <b>6</b>   | 578      | 13                     | <b>6</b>   | 53       | 7                      |
| <b>8</b>   | 604      | 13                     | <b>8</b>   | 40       | 6                      |
| <b>100</b> | 00628    | + 1                    | <b>200</b> | 00029    | - 5                    |

Appl d C t t + ∞

VIII

| $\delta$   | Equation |
|------------|----------|
| <b>d</b>   |          |
| <b>00</b>  | 0 100    |
| <b>04</b>  | 104      |
| <b>08</b>  | 108      |
| <b>12</b>  | 111      |
| <b>16</b>  | 113      |
| <b>20</b>  | 114      |
| <b>24</b>  | 00113    |
| <b>28</b>  | 11       |
| <b>32</b>  | 109      |
| <b>36</b>  | 106      |
| <b>40</b>  | 10       |
| <b>44</b>  | 00098    |
| <b>48</b>  | 94       |
| <b>52</b>  | 90       |
| <b>56</b>  | 88       |
| <b>60</b>  | 86       |
| <b>64</b>  | 00086    |
| <b>68</b>  | 88       |
| <b>72</b>  | 9        |
| <b>76</b>  | 93       |
| <b>80</b>  | 97       |
| <b>84</b>  | 00101    |
| <b>88</b>  | 105      |
| <b>92</b>  | 108      |
| <b>96</b>  | 111      |
| <b>100</b> | 113      |
| <b>104</b> | 00114    |
| <b>108</b> | 113      |
| <b>112</b> | 112      |
| <b>116</b> | 109      |
| <b>120</b> | 105      |
| <b>124</b> | 00101    |
| <b>128</b> | 97       |
| <b>132</b> | 93       |
| <b>136</b> | 90       |
| <b>140</b> | 88       |
| <b>144</b> | 00086    |
| <b>148</b> | 86       |
| <b>152</b> | 88       |
| <b>156</b> | 90       |
| <b>160</b> | 94       |
| <b>164</b> | 00098    |
| <b>168</b> | 102      |
| <b>172</b> | 105      |
| <b>176</b> | 108      |
| <b>180</b> | 111      |
| <b>184</b> | 00113    |
| <b>188</b> | 114      |
| <b>192</b> | 113      |
| <b>196</b> | 112      |
| <b>200</b> | 00108    |

Appl d C t t + ∞





# SATELLITE IV

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## Tables

of the

Longitude on Jupiter's Orbit,  
Variation of the Radius Vector,  
and the Latitude

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

IX Values of Mean Longitude and the Arguments at Epoch

| 1       | 2          | 3         | 4         | 5          | 6           | 7             | 8           | 9         | 10         | 11          |
|---------|------------|-----------|-----------|------------|-------------|---------------|-------------|-----------|------------|-------------|
| Date    | Mean Long. | A         | B         | C          | D           | E             | F           | G         | H          | $\alpha$    |
| 1850    | 141°80383  | d<br>0·85 | d<br>1·63 | d<br>7·110 | d<br>13·405 | d<br>11·78520 | d<br>43·215 | d<br>7·62 | d<br>3·407 | d<br>1785·1 |
| 1851    | 95·25885   | 1·73      | 1·23      | 8·935      | 11·128      | 9·59515       | 6·951       | 4·04      | 15·247     | 2150·2      |
| *1852   | 48·71386   | 0·63      | 0·84      | 10·761     | 8·852       | 7·40510       | 20·845      | 0·46      | 10·270     | 2515·4      |
| 1853    | 23·73998   | 0·54      | 1·44      | 1·064      | 7·576       | 6·21506       | 35·739      | 6·26      | 6·294      | 2881·5      |
| 1854    | 337·19500  | 1·42      | 1·04      | 2·890      | 5·300       | 4·02501       | 49·634      | 2·68      | 1·317      | 3246·5      |
| 1855    | 290·65001  | 0·32      | 0·65      | 4·715      | 3·024       | 1·83497       | 13·370      | 7·48      | 13·157     | 3611·7      |
| *1856   | 244·10503  | 1·20      | 0·25      | 6·541      | 0·748       | 16·33538      | 27·264      | 3·90      | 8·180      | 3976·4      |
| 1857    | 219·13115  | 1·10      | 0·85      | 9·367      | 16·166      | 15·14533      | 42·158      | 1·33      | 4·204      | 9·7         |
| 1858    | 172·58617  | 0·00      | 0·46      | 11·193     | 13·890      | 12·95529      | 5·895       | 6·12      | 16·044     | 374·6       |
| 1859    | 126·04118  | 0·88      | 0·06      | 0·495      | 11·614      | 10·76524      | 19·789      | 2·55      | 11·067     | 739·6       |
| *1860   | 79·49620   | 1·76      | 4·18      | 2·321      | 9·338       | 8·57520       | 33·683      | 7·34      | 6·090      | 1104·7      |
| 1861    | 54·52232   | 1·66      | 0·27      | 5·147      | 8·062       | 7·38515       | 48·577      | 4·77      | 2·114      | 1470·9      |
| 1862    | 7·97734    | 0·57      | 4·38      | 6·973      | 5·786       | 5·19510       | 12·314      | 1·19      | 13·954     | 1836·2      |
| 1863    | 321·43235  | 1·45      | 3·99      | 8·799      | 3·510       | 3·00506       | 26·208      | 5·99      | 8·977      | 2201·2      |
| *1864   | 274·88737  | 0·35      | 3·59      | 10·624     | 1·234       | 0·81501       | 40·102      | 2·41      | 4·000      | 2565·9      |
| 1865    | 249·91349  | 0·25      | 4·19      | 0·927      | 16·652      | 16·31542      | 4·838       | 8·21      | 0·024      | 2931·3      |
| 1866    | 203·36851  | 1·13      | 3·80      | 2·753      | 14·376      | 14·12538      | 18·733      | 4·63      | 11·864     | 3295·8      |
| 1867    | 156·82352  | 0·03      | 3·40      | 4·579      | 12·100      | 11·93533      | 32·627      | 1·05      | 6·887      | 3659·9      |
| *1868   | 110·27854  | 0·91      | 3·00      | 6·404      | 9·824       | 9·74529       | 46·521      | 5·85      | 1·910      | 4024·6      |
| 1869    | 85·30466   | 0·81      | 3·61      | 9·230      | 8·548       | 8·55524       | 11·257      | 3·27      | 14·751     | 58·1        |
| 1870    | 38·75968   | 1·69      | 3·21      | 11·056     | 6·271       | 6·36520       | 25·152      | 8·07      | 9·774      | 423·5       |
| 1871    | 352·21469  | 0·60      | 2·81      | 0·359      | 3·995       | 4·17515       | 39·046      | 4·49      | 4·797      | 789·2       |
| *1872   | 305·66971  | 1·48      | 2·42      | 2·184      | 1·719       | 1·98511       | 2·782       | 0·91      | 16·637     | 1155·0      |
| 1873    | 280·69583  | 1·38      | 3·02      | 5·010      | 0·443       | 0·79506       | 17·676      | 6·71      | 12·661     | 1521·6      |
| 1874    | 234·15085  | 0·28      | 2·62      | 6·836      | 14·861      | 15·29547      | 31·571      | 3·13      | 7·684      | 1886·9      |
| 1875    | 187·60586  | 1·16      | 2·23      | 8·662      | 12·585      | 13·10542      | 45·465      | 7·93      | 2·707      | 2251·8      |
| *1876   | 141·06088  | 0·06      | 1·83      | 10·488     | 10·309      | 10·91538      | 9·201       | 4·35      | 14·547     | 2616·2      |
| 1877    | 116·08700  | 1·94      | 2·43      | 0·790      | 9·033       | 9·72533       | 24·095      | 1·77      | 10·571     | 2981·5      |
| 1878    | 69·54202   | 0·84      | 2·04      | 2·616      | 6·757       | 7·53529       | 37·990      | 6·57      | 5·594      | 3345·8      |
| 1879    | 22·99703   | 1·73      | 1·64      | 4·442      | 4·481       | 5·34524       | 1·726       | 2·99      | 0·617      | 3710·2      |
| *1880   | 336·45205  | 0·63      | 1·24      | 6·268      | 2·205       | 3·15520       | 15·620      | 7·79      | 12·457     | 4075·1      |
| 1881    | 311·47817  | 0·53      | 1·85      | 9·093      | 0·929       | 1·96515       | 30·514      | 5·21      | 8·480      | 108·8       |
| 1882    | 264·93319  | 1·41      | 1·45      | 10·919     | 15·347      | 16·46556      | 44·409      | 1·64      | 3·504      | 474·4       |
| 1883    | 218·38820  | 0·31      | 1·05      | 0·222      | 13·071      | 14·27552      | 8·145       | 6·43      | 15·344     | 840·0       |
| *1884   | 171·84322  | 1·19      | 0·66      | 2·048      | 10·795      | 12·08547      | 22·039      | 2·86      | 10·367     | 1205·4      |
| 1885    | 146·86934  | 1·09      | 1·26      | 4·873      | 9·519       | 10·89543      | 36·933      | 0·28      | 6·390      | 1571·5      |
| 1886    | 100·32436  | 1·97      | 0·86      | 6·699      | 7·243       | 8·70538       | 0·670       | 5·08      | 1·414      | 1936·3      |
| 1887    | 53·77937   | 0·88      | 0·47      | 8·525      | 4·967       | 6·51533       | 14·564      | 1·50      | 13·254     | 2300·9      |
| *1888   | 7·23439    | 1·76      | 0·07      | 10·351     | 2·690       | 4·32529       | 28·458      | 6·30      | 8·277      | 2665·5      |
| 1889    | 342·26051  | 1·66      | 0·67      | 0·653      | 1·414       | 3·13524       | 43·352      | 3·72      | 4·300      | 3031·2      |
| 1890    | 295·71553  | 0·56      | 0·28      | 2·479      | 15·833      | 0·94520       | 7·089       | 0·14      | 16·141     | 3396·1      |
| 1891    | 249·17054  | 1·44      | 4·39      | 4·305      | 13·556      | 15·44561      | 20·983      | 4·94      | 11·164     | 3761·4      |
| *1892   | 202·62556  | 0·34      | 3·99      | 6·131      | 11·280      | 13·25556      | 34·877      | 1·36      | 6·187      | 4126·8      |
| 1893    | 177·65168  | 0·24      | 4·60      | 8·957      | 10·004      | 12·06552      | 49·771      | 7·16      | 2·210      | 160·6       |
| 1894    | 131·10670  | 1·12      | 4·20      | 10·782     | 7·728       | 9·87547       | 13·508      | 3·58      | 14·051     | 526·0       |
| 1895    | 84·56171   | 0·03      | 3·80      | 0·085      | 5·452       | 7·68543       | 27·402      | 0·00      | 9·074      | 891·2       |
| *1896   | 38·01673   | 0·91      | 3·41      | 1·911      | 3·176       | 5·49538       | 41·296      | 4·80      | 4·097      | 1256·1      |
| 1897    | 13·04285   | 0·81      | 4·01      | 4·737      | 1·900       | 4·30533       | 6·032       | 2·22      | 0·120      | 1621·9      |
| 1898    | 326·49787  | 1·69      | 3·61      | 6·562      | 16·318      | 2·11529       | 19·927      | 7·02      | 11·961     | 1986·5      |
| 1899    | 279·95288  | 0·59      | 3·22      | 8·388      | 14·042      | 16·61570      | 33·821      | 3·44      | 6·984      | 2351·2      |
| 1900    | 233·40790  | 1·47      | 2·82      | 10·214     | 11·766      | 14·42565      | 47·715      | 8·24      | 2·007      | 2716·0      |
| Periods | ...        | 1·98      | 4·51      | 12·523     | 16·694      | 16·69046      | 50·158      | 8·38      | 16·817     | 4332·6      |

Constant applied to each entry in Column 2:  $-1^{\circ}00000$ .

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### IX Values of Mean Longitude and the Arguments at Epoch

|         | 3                       | 4                    | 5    | 6       | 7      | 8     | 9     |                       |       |
|---------|-------------------------|----------------------|------|---------|--------|-------|-------|-----------------------|-------|
| I       | J                       | K                    | L    | M       | N      | O     | P     | Q                     | R     |
| 1850    | <sup>a</sup><br>8 68994 | <sup>a</sup><br>6 74 | 5 61 | 4 7937  | 535    | 6 53  | 16 49 | <sup>a</sup><br>15 49 | 1 83  |
| 1851    | 6 53158                 | 4 599                | 3 51 | 6659    | 0 496  | 1 52  | 10 4  | 14 74                 | 15 0  |
| 1852    | 4 373 3                 | 456                  | 1 41 | 0 538   | 15 140 | 13 33 | 3 59  | 13 99                 | 11 43 |
| 1853    | 3 1487                  | 1 313                | 0 3  | 16 9 8  | 14 101 | 9 3   | 15    | 14 4                  | 8 85  |
| 1854    | 1 05651                 | 7 514                | 6 56 | 13 9699 | 1 62   | 4 31  | 8 57  | 13 49                 | 5 7   |
| 1855    | 15 58717                | 5 371                | 4 46 | 11 64 0 | 10 0 3 | 16 1  | 1     | 1 74                  | 1 69  |
| 1856    | 13 4 881                | 3 2 7                | 36   | 9 714   | 7 984  | 11 11 | 1 55  | 11 99                 | 14 87 |
| 1857    | 1 27 46                 | 2 084                | 1 6  | 8 5863  | 6 945  | 7 1   | 7 10  | 1 4                   | 1 29  |
| 1858    | 1 1210                  | 8 285                | 7 51 | 6 4584  | 4 906  | 2 9   | 0 65  | 11 49                 | 8 71  |
| 1859    | 7 95374                 | 6 14                 | 5 41 | 4 3305  | 867    | 13 90 | 11 09 | 1 74                  | 5 13  |
| *1860   | 5 79539                 | 3 999                | 3 31 | 0 7     | 0 828  | 8 89  | 4 63  | 9 99                  | 1 56  |
| 1861    | 4 63703                 | 856                  | 1    | 1 0748  | 16 473 | 4 88  | 16 07 | 10 25                 | 15 73 |
| 1862    | 47867                   | 0 713                | 0 11 | 15 6346 | 14 433 | 16 69 | 9 6   | 9 50                  | 12 15 |
| 1863    | 0 3 3                   | 6 914                | 6 36 | 13 5067 | 12 394 | 11 69 | 3 17  | 8 75                  | 8 57  |
| 1864    | 14 85 97                | 4 771                | 4 6  | 11 3788 | 10 355 | 6 68  | 13 60 | 8 00                  | 5 00  |
| 1865    | 13 69 62                | 3 6 7                | 3 16 | 10 509  | 9 316  | 67    | 8 15  | 8 25                  | 2 42  |
| 1866    | 11 534 6                | 1 484                | 1 6  | 8 1231  | 7 277  | 14 48 | 1 70  | 7 50                  | 15 59 |
| 1867    | 9 37590                 | 7 685                | 7 30 | 5 9952  | 5 38   | 9 47  | 1 13  | 6 75                  | 12 02 |
| *1868   | 7 1755                  | 5 542                | 5 21 | 3 8673  | 3 199  | 4 46  | 5 68  | 6 00                  | 8 44  |
| 1869    | 6 05919                 | 4 399                | 3 11 | 2 7395  | 160    | 0 45  | 0 3   | 6 25                  | 5 86  |
| 1870    | 3 90083                 | 56                   | 01   | 0 6116  | 0 121  | 12 26 | 10 66 | 5 50                  | 2 28  |
| 1871    | 1 74248                 | 0 113                | 8 25 | 15 1714 | 14 766 | 7 25  | 4 1   | 4 75                  | 15 46 |
| *1872   | 16 27314                | 6 314                | 6 15 | 13 0435 | 12 7 7 | 2 24  | 14 64 | 4 00                  | 11 88 |
| 1873    | 15 11478                | 5 171                | 5 06 | 11 9156 | 11 688 | 15 05 | 9 19  | 4 25                  | 9 30  |
| 1874    | 1 95642                 | 3 0 8                | 2 96 | 9 7877  | 9 649  | 10 04 | 74    | 3 50                  | 5 72  |
| 1875    | 10 79806                | 0 884                | 0 86 | 7 6599  | 7 610  | 5 3   | 13 18 | 2 75                  | 2 14  |
| *1876   | 8 63971                 | 7 085                | 7 10 | 5 5320  | 5 571  | 0 02  | 6 72  | 2 00                  | 15 3  |
| 1877    | 7 48135                 | 5 942                | 6 00 | 4 4041  | 4 53   | 12 83 | 1 7   | 2 25                  | 12 74 |
| 1878    | 5 3 299                 | 3 799                | 3 91 | 763     | 493    | 7 83  | 11 71 | 1 50                  | 9 16  |
| 1879    | 3 16464                 | 1 656                | 1 81 | 0 1484  | 0 454  | 2 8   | 5 26  | 0 75                  | 5 59  |
| *1880   | 1 00628                 | 7 857                | 8 05 | 14 7082 | 15 098 | 14 63 | 15 69 | 0 00                  | 2 01  |
| 1881    | 16 53694                | 6 714                | 6 95 | 13 5803 | 14 059 | 10 62 | 10 24 | 0 26                  | 16 18 |
| 1882    | 14 37858                | 4 571                | 4 85 | 11 4524 | 12 0 0 | 5 61  | 3 79  | 16 13                 | 12 61 |
| 1883    | 1 0 3                   | 4 8                  | 2 76 | 9 3245  | 9 981  | 60    | 14 2  | 15 38                 | 9 03  |
| *1884   | 1 06187                 | 0 85                 | 0 66 | 7 1967  | 7 942  | 1 41  | 7 77  | 14 63                 | 5 45  |
| 1885    | 8 90351                 | 7 486                | 7 90 | 6 0688  | 6 903  | 8 40  | 2 32  | 14 88                 | 2 87  |
| 1886    | 6 74515                 | 5 34                 | 5 8  | 3 94 9  | 4 864  | 3 39  | 12 75 | 14 13                 | 16 05 |
| 1887    | 4 58680                 | 3 199                | 3 70 | 1 8131  | 825    | 15 2  | 6 30  | 13 38                 | 12 47 |
| *1888   | 4 844                   | 1 56                 | 1 60 | 16 37 8 | 786    | 10 19 | 16 73 | 1 63                  | 8 89  |
| 1889    | 1 70 8                  | 8 57                 | 0 51 | 15 449  | 16 431 | 6 18  | 11 8  | 12 88                 | 6 31  |
| 1890    | 15 80074                | 6 114                | 6 75 | 13 1171 | 14 39  | 1 17  | 4 83  | 12 13                 | 2 73  |
| 1891    | 13 64239                | 3 971                | 4 65 | 10 9892 | 1 353  | 12 98 | 15 27 | 11 39                 | 15 91 |
| *1892   | 11 484 3                | 1 8 8                | 55   | 8 8613  | 10 314 | 7 97  | 8 81  | 10 64                 | 12 33 |
| 1893    | 10 3 567                | 0 685                | 1 45 | 7 7335  | 9 75   | 3 97  | 3 36  | 10 89                 | 9 75  |
| 1894    | 8 1673                  | 6 886                | 7 70 | 5 6 56  | 7 36   | 15 78 | 13 80 | 10 14                 | 6 18  |
| 1895    | 6 00896                 | 4 743                | 5 60 | 3 4777  | 5 197  | 10 77 | 7 35  | 9 39                  | 2 60  |
| 1896    | 3 85060                 | 599                  | 3 50 | 1 3499  | 3 157  | 5 76  | 0 90  | 8 64                  | 15 77 |
| 1897    | 2 692 4                 | 1 456                | 40   | 0       | 118    | 1 75  | 1 33  | 8 89                  | 13 19 |
| 1898    | 53389                   | 7 657                | 0 3  | 14 7817 | 0 79   | 13 56 | 5 88  | 8 14                  | 9 62  |
| 1899    | 15 06455                | 5 514                | 6 55 | 1 6539  | 14 724 | 8 55  | 16 31 | 7 39                  | 6 04  |
| 1900    | 12 90619                | 3 371                | 4 45 | 10 5 6  | 12 685 | 3 54  | 9 86  | 6 64                  | 46    |
| Pe 10ds | 16 689                  | 8 344                | 8 34 | 16 6876 | 16 684 | 16 82 | 16 88 | 16 6                  | 16 75 |

T bt i th T L git d d dt J pit O bt th ti f O lum m tb ppl m ted by th q ti f T bl XII XXXII

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values of Mean Longitude and the Arguments at Epoch

| 1       | 2           | 3    | 4    | 5      | 6      | 7        | 8      | 9    | 10     | 11     |
|---------|-------------|------|------|--------|--------|----------|--------|------|--------|--------|
| Date    | Mean Long.  | A    | B    | C      | D      | E        | F      | G    | H      | I      |
| 1900    | 233°40'7.90 | 1°47 | 2°81 | 10°211 | 11°766 | 14°42565 | 17°715 | 8°24 | 21°07  | 27°16  |
| 1901    | 186°86'29.1 | 0°37 | 2°42 | 12°040 | 9°190  | 12°23561 | 11°151 | 4°66 | 13°84  | 3°81.1 |
| 1902    | 140°31'79.3 | 1°25 | 2°01 | 1°342  | 7°214  | 10°45556 | 25°416 | 1°08 | 8°81   | 144°4  |
| 1903    | 93°77'29.4  | 0°15 | 1°63 | 3°168  | 4°938  | 7°85552  | 19°240 | 5°88 | 3°04   | 1811°6 |
| *1904   | 47°22'79.6  | 1°03 | 1°23 | 4°994  | 2°662  | 5°66547  | 2°976  | 2°30 | 15°734 | 31°66  |
| 1905    | 22°25'40.8  | 0°94 | 1°84 | 7°820  | 1°386  | 1°47513  | 17°870 | 8°10 | 11°22  | 2°99   |
| 1906    | 335°70'09.9 | 1°82 | 1°44 | 9°616  | 15°804 | 2°28518  | 31°064 | 1°32 | 6°78   | 5°47   |
| 1907    | 289°16'41.1 | 0°72 | 1°04 | 11°471 | 11°528 | 0°95511  | 45°059 | 0°93 | 1°54   | 910°5  |
| *1908   | 242°61'91.2 | 1°60 | 0°65 | 10°774 | 11°252 | 14°59575 | 9°095  | 5°74 | 11°443 | 13°43  |
| 1909    | 217°64'52.5 | 1°50 | 1°25 | 3°600  | 9°976  | 13°40571 | 24°279 | 1°17 | 9°66   | 1670°4 |
| 1910    | 171°10'02.6 | 0°40 | 0°85 | 5°426  | 7°699  | 11°21566 | 38°151 | 7°96 | 4°69   | 20°54  |
| 1911    | 124°55'52.8 | 1°28 | 0°46 | 7°251  | 5°423  | 9°02561  | 1°920  | 4°39 | 16°531 | 24°06  |
| *1912   | 78°01'02.9  | 0°18 | 0°06 | 9°077  | 1°447  | 6°83556  | 15°814 | 1°81 | 11°554 | 276°5  |
| 1913    | 53°03'64.2  | 0°09 | 0°66 | 11°903 | 1°871  | 5°64552  | 10°708 | 6°61 | 7°57   | 1131°8 |
| 1914    | 6°49'14.3   | 0°97 | 0°27 | 1°206  | 16°289 | 3°45547  | 44°602 | 1°03 | 2°60   | 3496°8 |
| 1915    | 319°94'64.5 | 1°85 | 4°38 | 3°031  | 14°013 | 1°26543  | 8°339  | 7°81 | 14°441 | 2861°6 |
| *1916   | 273°40'14.6 | 0°75 | 3°98 | 4°857  | 11°737 | 15°26584 | 22°233 | 4°25 | 9°464  | 4126°4 |
| 1917    | 248°42'75.9 | 0°65 | 0°08 | 7°683  | 10°461 | 14°57579 | 17°127 | 1°67 | 5°487  | 219°5  |
| 1918    | 201°88'26.0 | 1°53 | 4°19 | 9°509  | 8°185  | 12°38575 | 0°863  | 6°47 | 0°510  | 614°5  |
| 1919    | 155°33'76.2 | 0°43 | 3°79 | 11°335 | 5°909  | 10°19570 | 14°758 | 2°89 | 12°151 | 986°6  |
| *1920   | 108°79'26.3 | 1°31 | 3°40 | 10°637 | 3°631  | 8°09566  | 28°652 | 7°69 | 7°174  | 1354°8 |
| 1921    | 83°81'87.6  | 1°21 | 4°00 | 3°463  | 2°357  | 6°81561  | 41°546 | 5°11 | 1°397  | 1721°1 |
| 1922    | 37°27'37.7  | 0°12 | 3°60 | 5°289  | 0°081  | 4°62556  | 1°282  | 1°53 | 15°237 | 2086°5 |
| 1923    | 350°72'87.9 | 1°00 | 3°21 | 7°115  | 14°499 | 2°43552  | 21°127 | 6°11 | 1°261  | 2451°1 |
| *1924   | 304°18'38.0 | 1°88 | 2°81 | 8°947  | 12°223 | 0°24547  | 15°071 | 2°75 | 5°284  | 2816°0 |
| 1925    | 279°20'99.3 | 1°78 | 3°41 | 11°766 | 10°947 | 15°74588 | 49°965 | 0°17 | 1°327  | 3181°3 |
| 1926    | 232°66'49.4 | 0°68 | 3°02 | 1°069  | 8°671  | 13°55584 | 13°701 | 4°97 | 13°147 | 3545°5 |
| 1927    | 186°11'99.6 | 1°56 | 2°62 | 2°895  | 6°395  | 11°36579 | 27°496 | 1°19 | 8°171  | 3909°8 |
| *1928   | 139°57'49.7 | 0°46 | 2°22 | 4°720  | 4°118  | 9°17575  | 41°490 | 6°19 | 3°194  | 4274°5 |
| 1929    | 114°60'11.0 | 0°36 | 2°83 | 7°546  | 2°842  | 7°98570  | 6°226  | 3°61 | 16°034 | 308°0  |
| 1930    | 68°05'61.1  | 1°25 | 2°43 | 9°372  | 0°566  | 5°79566  | 20°120 | 0°03 | 11°557 | 6°16   |
| 1931    | 21°51'11.3  | 0°15 | 2°03 | 11°198 | 14°984 | 3°60561  | 34°015 | 4°83 | 6°081  | 1019°3 |
| *1932   | 334°96'61.4 | 1°03 | 1°64 | 0°500  | 12°708 | 1°41557  | 47°909 | 1°26 | 1°104  | 1405°0 |
| 1933    | 309°99'22.7 | 0°93 | 2°24 | 3°326  | 11°432 | 0°22552  | 12°645 | 7°05 | 13°943 | 1771°6 |
| 1934    | 263°44'72.8 | 1°81 | 1°84 | 5°152  | 9°156  | 14°72593 | 26°439 | 3°48 | 8°967  | 2136°8 |
| 1935    | 216°90'23.0 | 0°71 | 1°45 | 6°978  | 6°880  | 12°53589 | 40°434 | 8°27 | 1°990  | 2501°6 |
| *1936   | 170°35'73.1 | 1°59 | 1°05 | 8°804  | 4°604  | 10°34584 | 4°170  | 4°70 | 15°831 | 2866°0 |
| 1937    | 145°38'34.4 | 1°49 | 1°65 | 11°629 | 3°328  | 9°15579  | 19°064 | 2°12 | 11°854 | 3231°2 |
| 1938    | 98°83'84.5  | 0°40 | 1°26 | 0°932  | 1°052  | 6°96575  | 32°958 | 6°92 | 6°877  | 3595°4 |
| 1939    | 52°29'34.7  | 1°28 | 0°86 | 2°758  | 15°470 | 4°77570  | 46°853 | 3°34 | 1°900  | 3960°0 |
| *1940   | 5°74'84.8   | 0°18 | 0°46 | 4°584  | 13°194 | 2°58566  | 10°589 | 8°14 | 13°741 | 4324°9 |
| 1941    | 340°77'46.1 | 0°08 | 1°07 | 7°409  | 11°918 | 1°39561  | 25°483 | 5°56 | 9°764  | 358°7  |
| 1942    | 294°22'96.2 | 0°96 | 0°67 | 9°235  | 9°642  | 15°89602 | 39°377 | 1°98 | 4°787  | 724°3  |
| 1943    | 247°68'46.4 | 1°84 | 0°27 | 11°061 | 7°366  | 13°70598 | 3°114  | 6°78 | 16°628 | 1089°8 |
| *1944   | 201°13'96.5 | 0°74 | 4°39 | 0°364  | 5°090  | 11°51593 | 17°008 | 3°20 | 11°651 | 1455°1 |
| 1945    | 176°16'57.8 | 0°64 | 0°48 | 3°189  | 3°814  | 10°32589 | 31°902 | 0°62 | 7°674  | 1821°1 |
| 1946    | 129°62'07.9 | 1°52 | 0°08 | 5°015  | 1°537  | 8°13584  | 45°796 | 5°42 | 2°697  | 2185°9 |
| 1947    | 83°07'58.1  | 0°43 | 4°20 | 6°841  | 15°956 | 5°94579  | 9°533  | 1°84 | 14°537 | 2550°5 |
| *1948   | 36°53'08.2  | 1°31 | 3°80 | 8°667  | 13°680 | 3°75575  | 23°427 | 6°64 | 9°561  | 2915°2 |
| 1949    | 11°55'69.5  | 1°21 | 4°41 | 11°493 | 12°404 | 2°56570  | 38°321 | 4°06 | 5°584  | 3281°0 |
| 1950    | 325°01'19.6 | 0°11 | 4°01 | 0°795  | 10°127 | 0°37566  | 2°057  | 0°48 | 0°607  | 3646°0 |
| Periods | ...         | 1°98 | 4°51 | 12°523 | 16°694 | 16°69046 | 50°158 | 8°38 | 16°817 | 4332°6 |

Constant applied to each entry in Column 2: - 1°00000.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

IX *continued* Values of Mean Longitude and the Arguments at Epoch

|       | 3        | 4     | 5    | 6       | 7      | 8         | 9         |           |           |
|-------|----------|-------|------|---------|--------|-----------|-----------|-----------|-----------|
| I     | J        | K     | L    | M       | N      | O         | P         | Q         | R         |
| 1900  | 12 9 619 | 3 371 | 4 45 | 10 5 60 | 1 685  | d<br>3 54 | d<br>9 86 | d<br>6 64 | d<br>2 46 |
| 1901  | 10 74783 | 1 8   | 35   | 8 3981  | 10 646 | 15 35     | 3 41      | 5 89      | 15 64     |
| 1902  | 8 58948  | 7 429 | 5    | 6 7 3   | 8 607  | 10 34     | 13 84     | 5 14      | 1 06      |
| 1903  | 6 4311   | 5 86  | 6 50 | 4 14 4  | 6 568  | 5 33      | 7 39      | 4 39      | 8 48      |
| 1904  | 4 27 76  | 3 143 | 4 4  | 2 145   | 4 5 9  | 0 3       | 94        | 3 64      | 4 90      |
| 1905  | 3 11441  | 1 999 | 3 30 | 0 8866  | 3 490  | 13 13     | 12 37     | 3 89      | 2 32      |
| 1906  | 0 956 5  | 8 01  | 1 20 | 15 4464 | 1 450  | 8 12      | 5 92      | 3 14      | 15 50     |
| 1907  | 15 48671 | 6 057 | 7 45 | 13 3185 | 16 095 | 3 11      | 16 36     | 2 39      | 11 92     |
| 1908  | 13 32835 | 3 914 | 5 35 | 11 1907 | 14 056 | 14 9      | 9 91      | 1 64      | 8 34      |
| 1909  | 1 16999  | 2 771 | 4 5  | 10 06 8 | 13 017 | 10 9      | 4 45      | 1 89      | 5 76      |
| 1910  | 10 01164 | 0 628 | 15   | 7 9349  | 10 978 | 5 91      | 14 89     | 1 14      | 2 19      |
| 1911  | 7 853 8  | 6 8 9 | 0 05 | 5 8071  | 8 939  | 0 90      | 8 44      | 0 40      | 15 36     |
| *1912 | 5 69492  | 4 686 | 6 30 | 3 679   | 6 90   | 12 71     | 1 99      | 16 27     | 11 78     |
| 1913  | 4 53657  | 3 543 | 5 0  | 2 5513  | 5 861  | 8 70      | 13 4      | 16 52     | 9 1       |
| 1914  | 2 37821  | 1 4 0 | 3 10 | 0 4 34  | 3 82   | 3 69      | 6 97      | 15 77     | 5 63      |
| 1915  | 0 21985  | 7 601 | 1 00 | 14 983  | 1 783  | 15 50     | 0 5       | 15 0      | 2 05      |
| 1916  | 14 75 51 | 5 457 | 7 24 | 1 8553  | 16 428 | 10 49     | 10 95     | 14 27     | 15 22     |
| 1917  | 13 59215 | 4 314 | 6 14 | 11 7275 | 15 389 | 6 48      | 5 50      | 14 52     | 12 65     |
| 1918  | 11 43380 | 171   | 4 05 | 9 5996  | 13 350 | 1 47      | 15 93     | 13 77     | 9 07      |
| 1919  | 9 27544  | 0 0 8 | 1 95 | 7 4717  | 11 311 | 13 28     | 9 48      | 13 02     | 5 49      |
| 1920  | 7 11708  | 6 229 | 8 19 | 5 3438  | 9 272  | 8 27      | 3 03      | 12 28     | 1 91      |
| 1921  | 5 95873  | 5 086 | 7 09 | 4 2160  | 8 233  | 4 6       | 14 46     | 12 53     | 16 09     |
| 1922  | 3 80037  | 2 943 | 4 99 | 2 0881  | 6 194  | 16 07     | 8 01      | 11 78     | 1 51      |
| 1923  | 1 64 01  | 0 800 | 2 90 | 16 6479 | 4 155  | 11 06     | 1 56      | 11 03     | 8 93      |
| *1924 | 16 17 67 | 7 01  | 0 80 | 14 5 00 | 2 115  | 6 06      | 12 00     | 10 28     | 5 35      |
| 1925  | 15 0143  | 5 858 | 8 4  | 13 3921 | 1 077  | 05        | 6 54      | 10 53     | 2 78      |
| 1926  | 12 85596 | 3 714 | 5 94 | 11 2643 | 15 721 | 13 86     | 0 09      | 9 78      | 15 95     |
| 1927  | 10 69760 | 1 571 | 3 84 | 9 1364  | 13 68  | 8 85      | 10 53     | 1 03      | 1 37      |
| 1928  | 8 53924  | 7 772 | 1 75 | 7 0085  | 11 643 | 3 84      | 4 08      | 8 8       | 8 79      |
| 1929  | 7 38089  | 6 629 | 0 65 | 5 8806  | 10 604 | 16 65     | 15 51     | 8 53      | 6 22      |
| 1930  | 5 22 53  | 4 486 | 6 89 | 3 7528  | 8 565  | 11 64     | 9 06      | 7 78      | 64        |
| 1931  | 3 06417  | 343   | 4 79 | 1 6249  | 6 526  | 6 63      | 2 61      | 7 03      | 15 81     |
| *1932 | 0 90582  | 0 00  | 69   | 16 1847 | 4 487  | 1 6       | 13 04     | 6 28      | 12 24     |
| 1933  | 16 43648 | 7 401 | 1 60 | 15 0568 | 3 448  | 14 43     | 7 59      | 6 53      | 9 66      |
| 1934  | 14 7812  | 5 58  | 7 84 | 12 9 89 | 1 409  | 9 4       | 1 14      | 5 78      | 6 08      |
| 1935  | 1 11976  | 3 115 | 5 74 | 10 8011 | 16 054 | 4 41      | 11 57     | 5 03      | 2 50      |
| *1936 | 9 96141  | 971   | 3 64 | 8 673   | 14 015 | 16 2      | 5 12      | 4 8       | 15 68     |
| 1937  | 8 80305  | 8 17  | 54   | 7 5453  | 1 976  | 1 1       | 16 55     | 4 53      | 13 10     |
| 1938  | 6 64469  | 6 0 9 | 0 45 | 5 4174  | 10 937 | 7 20      | 10 10     | 3 78      | 9 52      |
| 1939  | 4 48633  | 3 886 | 6 69 | 3 896   | 8 898  | 2 20      | 3 65      | 3 03      | 5 94      |
| 1940  | 2 32798  | 1 743 | 4 59 | 1 1617  | 6 858  | 14 00     | 14 09     | 29        | 2 36      |
| 1941  | 1 16962  | 0 600 | 3 49 | 0 0338  | 5 819  | 10 00     | 8 63      | 2 54      | 16 54     |
| 1942  | 15 700 8 | 6 8 1 | 1 39 | 14 5936 | 3 78   | 4 99      | 2 18      | 1 79      | 12 96     |
| 1943  | 13 5419  | 4 658 | 7 64 | 1 4657  | 1 741  | 16 8      | 1 62      | 1 04      | 9 38      |
| 1944  | 11 38357 | 2 515 | 5 54 | 10 3378 | 16 386 | 11 79     | 6 17      | 0 29      | 5 81      |
| 1945  | 10 2521  | 1 371 | 4 44 | 9 10    | 15 347 | 7 18      | 0 72      | 0 54      | 3 23      |
| 1946  | 8 0668   | 7 572 | 34   | 7 08 1  | 13 308 | 2 77      | 11 15     | 16 41     | 16 4      |
| 1947  | 5 9 850  | 5 4 9 | 4    | 4 9542  | 11 69  | 14 58     | 4 70      | 15 66     | 12 82     |
| 1948  | 3 75014  | 3 286 | 6 49 | 8 64    | 9 230  | 9 57      | 15 13     | 14 91     | 9 25      |
| 1949  | 2 59178  | 143   | 5 39 | 1 6985  | 8 191  | 5 56      | 9 68      | 15 16     | 6 67      |
| 1950  | 0 4334   | 0 00  | 3 9  | 16 583  | 6 15   | 0 55      | 3 3       | 14 42     | 3 9       |
| P mod | 16 6890  | 8 344 | 8 34 | 16 6876 | 16 684 | 16 8      | 16 88     | 16 62     | 16 75     |

T bt mtl 1 L git d d dt J pt O bit th ti fCl m m tb ppl m t d by th q ti fT bl XII XXXII

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values of Mean Longitude and the Arguments at Epoch

| 1       | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           |
|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Date    | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | $\alpha$     |
|         | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| 1950    | 325°01196    | 0°11         | 4°01         | 0°795        | 10°127       | 0°37566      | 2°057        | 0°48         | 0°607        | 3646°0       |
| 1951    | 278°46698    | 0°99         | 3°61         | 2°621        | 7°851        | 14°87607     | 15°952       | 5°28         | 12°447       | 4011°3       |
| *1952   | 231°92199    | 1°87         | 3°22         | 4°447        | 5°575        | 12°68602     | 29°846       | 1°70         | 7°471        | 44°0         |
| 1953    | 206°94812    | 1°77         | 3°82         | 7°273        | 4°299        | 11°49598     | 44°740       | 7°50         | 3°494        | 410°4        |
| 1954    | 160°40313    | 0°67         | 3°42         | 9°098        | 2°023        | 9°30593      | 8°476        | 3°92         | 15°334       | 775°6        |
| 1955    | 113°85815    | 1°55         | 3°03         | 10°924       | 16°441       | 7°11589      | 22°371       | 0°34         | 10°357       | 1140°7       |
| *1956   | 67°31316     | 0°46         | 2°63         | 0°227        | 14°165       | 4°92584      | 36°265       | 5°14         | 5°381        | 1505°6       |
| 1957    | 42°33928     | 0°36         | 3°23         | 3°053        | 12°889       | 3°73579      | 1°001        | 2°56         | 1°404        | 1871°4       |
| 1958    | 355°79430    | 1°24         | 2°84         | 4°878        | 10°613       | 1°54575      | 14°895       | 7°36         | 13°244       | 2236°0       |
| 1959    | 309°24931    | 0°14         | 2°44         | 6°704        | 8°337        | 16°04616     | 28°790       | 3°79         | 8°267        | 2600°8       |
| *1960   | 262°70433    | 1°02         | 2°04         | 8°530        | 6°061        | 13°85611     | 42°684       | 0°21         | 3°291        | 2965°8       |
| 1961    | 237°73045    | 0°92         | 2°65         | 11°356       | 4°785        | 12°66607     | 7°420        | 6°01         | 16°131       | 3332°0       |
| 1962    | 191°18547    | 1°80         | 2°25         | 0°658        | 2°509        | 10°47602     | 21°314       | 2°43         | 11°154       | 3697°2       |
| 1963    | 144°64048    | 0°70         | 1°85         | 2°484        | 0°233        | 8°28598      | 35°209       | 7°23         | 6°177        | 4062°3       |
| *1964   | 98°09550     | 1°59         | 1°46         | 4°310        | 14°651       | 6°09593      | 49°103       | 3°65         | 1°200        | 94°7         |
| 1965    | 73°12162     | 1°49         | 2°06         | 7°136        | 13°375       | 4°90589      | 13°839       | 1°07         | 14°041       | 460°5        |
| 1966    | 26°57664     | 0°39         | 1°66         | 8°962        | 11°099       | 2°71584      | 27°733       | 5°87         | 9°064        | 825°3        |
| 1967    | 340°03165    | 1°27         | 1°27         | 10°787       | 8°823        | 0°52580      | 41°628       | 2°29         | 4°087        | 1190°3       |
| *1968   | 293°48667    | 0°17         | 0°87         | 0°090        | 6°546        | 15°02621     | 5°364        | 7°09         | 15°928       | 1555°0       |
| 1969    | 268°51279    | 0°07         | 1°47         | 2°916        | 5°270        | 13°83616     | 20°258       | 4°51         | 11°951       | 1921°1       |
| 1970    | 221°96781    | 0°95         | 1°08         | 4°742        | 2°994        | 11°64612     | 34°152       | 0°93         | 6°974        | 2286°3       |
| 1971    | 175°42282    | 1°83         | 0°68         | 6°567        | 0°718        | 9°45607      | 48°047       | 5°73         | 1°997        | 2651°5       |
| *1972   | 128°87784    | 0°73         | 0°28         | 8°393        | 15°136       | 7°26602      | 11°783       | 2°15         | 13°837       | 3016°6       |
| 1973    | 103°90396    | 0°64         | 0°89         | 11°219       | 13°860       | 6°07598      | 26°677       | 7°95         | 9°861        | 3382°7       |
| 1974    | 57°35898     | 1°52         | 0°49         | 0°522        | 11°584       | 3°88593      | 40°571       | 4°37         | 4°884        | 3747°5       |
| 1975    | 10°81399     | 0°42         | 0°09         | 2°347        | 9°308        | 1°69589      | 4°308        | 0°79         | 16°724       | 4112°2       |
| *1976   | 324°26901    | 1°30         | 4°21         | 4°173        | 7°032        | 16°19630     | 18°202       | 5°59         | 11°747       | 144°4        |
| 1977    | 299°29513    | 1°20         | 0°30         | 6°999        | 5°756        | 15°00625     | 33°096       | 3°01         | 7°771        | 510°8        |
| 1978    | 252°75015    | 0°10         | 4°41         | 8°825        | 3°480        | 12°81621     | 46°990       | 7°81         | 2°794        | 875°1        |
| 1979    | 206°20516    | 0°98         | 4°02         | 10°651       | 1°204        | 10°62616     | 10°727       | 4°23         | 14°634       | 1240°2       |
| *1980   | 159°66018    | 1°86         | 3°62         | 12°476       | 15°622       | 8°43612      | 24°621       | 0°65         | 9°657        | 1605°6       |
| 1981    | 134°68630    | 1°77         | 4°22         | 2°779        | 14°346       | 7°24607      | 39°515       | 6°45         | 5°681        | 1972°0       |
| 1982    | 88°14132     | 0°67         | 3°83         | 4°605        | 12°070       | 5°05602      | 3°251        | 2°87         | 0°704        | 2337°3       |
| 1983    | 41°59633     | 1°55         | 3°43         | 6°431        | 9°794        | 2°86598      | 17°146       | 7°67         | 12°544       | 2702°2       |
| *1984   | 355°05135    | 0°45         | 3°03         | 8°256        | 7°518        | 0°67593      | 31°040       | 4°09         | 7°567        | 3066°6       |
| 1985    | 330°07747    | 0°35         | 3°64         | 11°082       | 6°242        | 16°17634     | 45°934       | 1°52         | 3°591        | 3431°9       |
| 1986    | 283°53249    | 1°23         | 3°24         | 0°385        | 3°965        | 13°98630     | 9°670        | 6°32         | 15°431       | 3796°0       |
| 1987    | 236°98750    | 0°13         | 2°84         | 2°211        | 1°689        | 11°79625     | 23°565       | 2°74         | 10°454       | 4160°3       |
| *1988   | 190°44252    | 1°01         | 2°45         | 4°036        | 16°108       | 9°60621      | 37°459       | 7°54         | 5°477        | 192°6        |
| 1989    | 165°46864    | 0°92         | 3°05         | 6°862        | 14°832       | 8°41616      | 2°195        | 4°96         | 1°501        | 558°8        |
| 1990    | 118°92366    | 1°80         | 2°65         | 8°688        | 12°555       | 6°22612      | 16°089       | 1°38         | 13°341       | 924°3        |
| 1991    | 72°37867     | 0°70         | 2°26         | 10°514       | 10°279       | 4°03607      | 29°984       | 6°18         | 8°364        | 1290°1       |
| *1992   | 25°83369     | 1°58         | 1°86         | 12°340       | 8°003        | 1°84603      | 43°878       | 2°60         | 3°387        | 1655°8       |
| 1993    | 0°85981      | 1°48         | 2°46         | 2°642        | 6°727        | 0°65598      | 8°614        | 0°02         | 16°228       | 2022°3       |
| 1994    | 314°31483    | 0°38         | 2°07         | 4°468        | 4°451        | 15°15639     | 22°508       | 4°82         | 11°251       | 2387°4       |
| 1995    | 267°76984    | 1°26         | 1°67         | 6°294        | 2°175        | 12°96634     | 36°403       | 1°24         | 6°274        | 2752°1       |
| *1996   | 221°22486    | 0°16         | 1°27         | 8°120        | 16°593       | 10°77630     | 0°139        | 6°04         | 1°297        | 3116°4       |
| 1997    | 196°25098    | 0°07         | 1°88         | 10°945       | 15°317       | 9°58625      | 15°033       | 3°46         | 14°138       | 3481°6       |
| 1998    | 149°70600    | 0°95         | 1°48         | 0°248        | 13°041       | 7°39621      | 28°927       | 8°26         | 9°161        | 3845°9       |
| 1999    | 103°16101    | 1°83         | 1°08         | 2°074        | 10°765       | 5°20616      | 42°822       | 4°68         | 4°184        | 4210°5       |
| *2000   | 56°61603     | 0°73         | 0°69         | 3°900        | 8°489        | 3°01612      | 6°558        | 1°10         | 16°024       | 242°9        |
| Periods | ...          | 1°98         | 4°51         | 12°523       | 16°694       | 16°69046     | 50°158       | 8°38         | 16°817       | 4332°6       |

Constant applied to each entry in Column 2:  $-1^{\circ}00000$ .

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

IX continued Values of Mean Longitude and the Arguments at Epoch

|         | 3        | 4                     | 5    | 6       | 7      | 8                    | 9     |       |                      |
|---------|----------|-----------------------|------|---------|--------|----------------------|-------|-------|----------------------|
| I       | J        | K                     | L    | M       | N      | O                    | P     | Q     | R                    |
| 1950    | 0 4334   | <sup>a</sup><br>0 000 | 3 9  | 16 583  | 6 15   | <sup>a</sup><br>0 55 | 3 23  | 14 42 | <sup>a</sup><br>3 09 |
| 1951    | 14 96408 | 6 01                  | 1 19 | 14 1304 | 4 113  | 12 36                | 13 66 | 13 67 | 16 27                |
| 1952    | 12 8 573 | 4 58                  | 7 44 | 12 025  | 2 074  | 7 35                 | 7 1   | 12 9  | 12 69                |
| 1953    | 11 64737 | 915                   | 6 34 | 10 8746 | 1 035  | 3 34                 | 1 76  | 13 17 | 10 11                |
| 1954    | 9 48901  | 0 77                  | 4 4  | 8 7468  | 15 679 | 15 15                | 1 19  | 12 42 | 6 53                 |
| 1955    | 7 33066  | 6 973                 | 14   | 6 6189  | 13 640 | 10 14                | 5 74  | 11 67 | 95                   |
| 1956    | 5 17 30  | 4 829                 | 0 04 | 4 4910  | 11 601 | 5 14                 | 16 18 | 10 92 | 16 13                |
| 1957    | 4 01394  | 3 686                 | 7 29 | 3 363   | 1 56   | 1 13                 | 10 73 | 11 17 | 13 55                |
| 1958    | 1 85559  | 1 543                 | 5 19 | 1 353   | 8 5 3  | 1 94                 | 4 27  | 10 4  | 9 97                 |
| 1959    | 16 386 4 | 7 744                 | 3 09 | 15 7950 | 6 484  | 7 93                 | 14 71 | 9 67  | 6 39                 |
| 1960    | 14 789   | 5 601                 | 0 99 | 13 6672 | 4 445  | 9                    | 8 26  | 8 9   | 2 8                  |
| 1961    | 13 06953 | 4 458                 | 8 3  | 12 5393 | 3 406  | 15 73                | 2 81  | 9 17  | 0 24                 |
| 1962    | 10 91117 | 2 315                 | 6 14 | 10 4114 | 1 367  | 10 72                | 13 24 | 8 4   | 13 41                |
| 1963    | 8 75282  | 0 172                 | 4 4  | 8 836   | 16 01  | 5 71                 | 6 79  | 7 67  | 9 84                 |
| 1964    | 6 59446  | 6 373                 | 1 94 | 6 1557  | 13 973 | 0 70                 | 0 34  | 6 92  | 6 26                 |
| 1965    | 5 43610  | 5 30                  | 0 84 | 5 0 78  | 12 934 | 13 51                | 11 77 | 7 17  | 3 68                 |
| 1966    | 3 7775   | 3 086                 | 7 08 | 2 9000  | 10 895 | 8 50                 | 5 32  | 6 4   | 0 10                 |
| 1967    | 1 11939  | 0 943                 | 4 99 | 0 7721  | 8 856  | 3 49                 | 15 75 | 5 67  | 13 8                 |
| *1968   | 15 65005 | 7 144                 | 2 89 | 15 3318 | 6 817  | 15 30                | 9 30  | 4 92  | 9 70                 |
| 1969    | 14 49169 | 6 001                 | 1 79 | 14 040  | 5 778  | 11 29                | 3 85  | 5 17  | 7 12                 |
| 1970    | 12 33333 | 3 858                 | 8 03 | 12 0761 | 3 739  | 6 28                 | 14 28 | 4 43  | 3 54                 |
| 1971    | 10 17498 | 1 715                 | 5 93 | 9 948   | 1 700  | 1 28                 | 7 83  | 3 68  | 16 7                 |
| *1972   | 8 1662   | 7 916                 | 3 83 | 7 8204  | 16 344 | 13 09                | 1 38  | 2 93  | 13 14                |
| 1973    | 6 85826  | 6 773                 | 74   | 6 69 5  | 15 305 | 9 08                 | 12 82 | 3 18  | 10 56                |
| 1974    | 4 69991  | 4 630                 | 0 64 | 4 5646  | 13 266 | 4 07                 | 6 36  | 43    | 6 98                 |
| 1975    | 54155    | 2 486                 | 6 88 | 2 4367  | 11 27  | 15 88                | 16 80 | 1 68  | 3 41                 |
| *1976   | 0 38319  | 0 343                 | 4 78 | 0 3089  | 9 188  | 10 87                | 10 35 | 0 93  | 16 58                |
| 1977    | 15 91385 | 7 544                 | 3 68 | 15 8686 | 8 149  | 6 86                 | 4 90  | 1 18  | 14 00                |
| 1978    | 13 75550 | 5 401                 | 1 59 | 13 7408 | 6 110  | 1 85                 | 15 33 | 0 43  | 10 43                |
| 1979    | 11 59714 | 3 258                 | 7 83 | 11 61 9 | 4 071  | 13 66                | 8 88  | 16 30 | 6 85                 |
| *1980   | 9 43878  | 1 115                 | 5 73 | 9 4850  | 0 32   | 8 65                 | 43    | 15 56 | 3 7                  |
| 1981    | 8 2804   | 8 316                 | 4 63 | 8 3572  | 0 993  | 4 64                 | 13 86 | 15 81 | 0 69                 |
| 1982    | 6 1 207  | 6 173                 | 2 53 | 6 2293  | 15 638 | 16 45                | 7 41  | 15 06 | 13 87                |
| 1983    | 3 96371  | 4 03                  | 0 44 | 4 1014  | 13 599 | 11 44                | 0 96  | 14 31 | 10 29                |
| *1984   | 1 8 535  | 1 887                 | 6 68 | 1 9735  | 11 559 | 6 43                 | 11 39 | 13 56 | 6 71                 |
| 1985    | 0 64700  | 743                   | 5 58 | 0 8457  | 10 520 | 2 42                 | 5 94  | 13 81 | 4 13                 |
| 1986    | 15 17766 | 6 944                 | 3 48 | 15 4054 | 8 481  | 14 23                | 16 37 | 13 06 | 0 55                 |
| 1987    | 13 1930  | 4 801                 | 1 38 | 13 2776 | 6 442  | 9 23                 | 9 92  | 12 31 | 13 73                |
| *1988   | 10 86094 | 2 658                 | 7 63 | 11 1497 | 4 403  | 4 2                  | 3 47  | 11 56 | 10 15                |
| 1989    | 9 70 59  | 1 515                 | 6 53 | 10 0 18 | 3 364  | 0 21                 | 14 91 | 11 81 | 7 57                 |
| 1990    | 7 54423  | 7 716                 | 4 43 | 7 8940  | 1 3 5  | 12 02                | 8 45  | 11 06 | 3 99                 |
| 1991    | 5 38587  | 5 573                 | 2 33 | 5 7661  | 15 970 | 7 01                 | 2 00  | 10 31 | 0 4                  |
| 1992    | 3 751    | 3 430                 | 0 3  | 3 638   | 13 931 | 0                    | 1 44  | 9 56  | 13 59                |
| 1993    | 6916     | 87                    | 7 48 | 2 5103  | 1 89   | 14 81                | 6 99  | 9 81  | 11 01                |
| 1994    | 16 5998  | 144                   | 5 38 | 0 38 5  | 1 853  | 9 80                 | 0 54  | 9 06  | 7 44                 |
| 1995    | 14 44146 | 6 345                 | 3 8  | 14 94 2 | 8 814  | 4 79                 | 10 97 | 8 31  | 3 86                 |
| 1996    | 12 8310  | 4 201                 | 1 18 | 12 8144 | 6 775  | 16 60                | 4 5   | 7 56  | 0 28                 |
| 1997    | 11 12475 | 3 058                 | 0 08 | 11 6865 | 5 736  | 12 59                | 15 95 | 7 81  | 14 45                |
| 1998    | 8 96639  | 915                   | 6 33 | 9 5586  | 3 697  | 7 58                 | 9 50  | 7 06  | 10 88                |
| 1999    | 6 80803  | 7 116                 | 4 3  | 7 4307  | 1 658  | 57                   | 3 05  | 6 32  | 7 3                  |
| 2000    | 4 64968  | 4 973                 | 2 13 | 5 30 9  | 16 302 | 14 38                | 13 48 | 5 57  | 3 72                 |
| Pe o ls | 16 68902 | 8 344                 | 8 34 | 16 6876 | 16 684 | 16 8                 | 16 88 | 16 6  | 16 75                |

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# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### X Motions of Mean Longitude and the Arguments for Days

| 1              | 2          | 3    | 4    | 5      | 6      | 7        | 8      | 9    | 10     | 11       |
|----------------|------------|------|------|--------|--------|----------|--------|------|--------|----------|
| Day            | Mean Long. | A    | B    | C      | D      | E        | F      | G    | H      | $\alpha$ |
|                | °          | d    | d    | d      | d      | d        | d      | d    | d      | d        |
| <b>Jan. 1</b>  | 21°57111   | 1°00 | 1°00 | 1°000  | 1°000  | 1°00000  | 1°000  | 1°00 | 1°000  | 1°0      |
| <b>2</b>       | 43°14222   | 0°02 | 2°00 | 2°000  | 2°000  | 2°00000  | 2°000  | 2°00 | 2°000  | 2°0      |
| <b>3</b>       | 64°71333   | 1°02 | 3°00 | 3°000  | 3°000  | 3°00000  | 3°000  | 3°00 | 3°000  | 3°0      |
| <b>4</b>       | 86°28444   | 0°04 | 4°00 | 4°000  | 4°000  | 4°00000  | 4°000  | 4°00 | 4°000  | 4°0      |
| <b>5</b>       | 107°85555  | 1°04 | 0°49 | 5°000  | 5°000  | 5°00000  | 5°000  | 5°00 | 5°000  | 5°0      |
| <b>6</b>       | 129°42666  | 0°06 | 1°49 | 6°000  | 6°000  | 6°00000  | 6°000  | 6°00 | 6°000  | 6°0      |
| <b>7</b>       | 150°99777  | 1°06 | 2°49 | 7°000  | 7°000  | 7°00000  | 7°000  | 7°00 | 7°000  | 7°0      |
| <b>8</b>       | 172°56888  | 0°08 | 3°49 | 8°000  | 8°000  | 8°00000  | 8°000  | 8°00 | 8°000  | 8°0      |
| <b>9</b>       | 194°13999  | 1°08 | 4°49 | 9°000  | 9°000  | 9°00000  | 9°000  | 0°62 | 9°000  | 9°0      |
| <b>10</b>      | 215°71110  | 0°11 | 0°98 | 10°000 | 10°000 | 10°00000 | 10°000 | 1°62 | 10°000 | 10°0     |
| <b>11</b>      | 237°28221  | 1°11 | 1°98 | 11°000 | 11°000 | 11°00000 | 11°000 | 2°62 | 11°000 | 11°0     |
| <b>12</b>      | 258°85332  | 0°13 | 2°98 | 12°000 | 12°000 | 12°00000 | 12°000 | 3°62 | 12°000 | 12°0     |
| <b>13</b>      | 280°42443  | 1°13 | 3°98 | 0°477  | 13°000 | 13°00000 | 13°000 | 4°62 | 13°000 | 13°0     |
| <b>14</b>      | 301°99553  | 0°15 | 0°47 | 1°477  | 14°000 | 14°00000 | 14°000 | 5°62 | 14°000 | 14°0     |
| <b>15</b>      | 323°56664  | 1°15 | 1°47 | 2°477  | 15°000 | 15°00000 | 15°000 | 6°62 | 15°000 | 15°0     |
| <b>16</b>      | 345°13775  | 0°17 | 2°47 | 3°477  | 16°000 | 16°00000 | 16°000 | 7°62 | 16°000 | 16°0     |
| <b>17</b>      | 6°70886    | 1°17 | 3°47 | 4°477  | 0°306  | 0°30954  | 17°000 | 0°25 | 0°183  | 17°0     |
| <b>18</b>      | 28°27997   | 0°19 | 4°47 | 5°477  | 1°306  | 1°30954  | 18°000 | 1°25 | 1°183  | 18°0     |
| <b>19</b>      | 49°85108   | 1°19 | 0°96 | 6°477  | 2°306  | 2°30954  | 19°000 | 2°25 | 2°183  | 19°0     |
| <b>20</b>      | 71°42219   | 0°21 | 1°96 | 7°477  | 3°306  | 3°30954  | 20°000 | 3°25 | 3°183  | 20°0     |
| <b>21</b>      | 92°99330   | 1°21 | 2°96 | 8°477  | 4°306  | 4°30954  | 21°000 | 4°25 | 4°183  | 21°0     |
| <b>22</b>      | 114°56441  | 0°23 | 3°96 | 9°477  | 5°306  | 5°30954  | 22°000 | 5°25 | 5°183  | 22°0     |
| <b>23</b>      | 136°13552  | 1°23 | 0°44 | 10°477 | 6°306  | 6°30954  | 23°000 | 6°25 | 6°183  | 23°0     |
| <b>24</b>      | 157°70663  | 0°25 | 1°44 | 11°477 | 7°306  | 7°30954  | 24°000 | 7°25 | 7°183  | 24°0     |
| <b>25</b>      | 179°27774  | 1°25 | 2°44 | 12°477 | 8°306  | 8°30954  | 25°000 | 8°25 | 8°183  | 25°0     |
| <b>26</b>      | 200°84885  | 0°27 | 3°44 | 0°954  | 9°306  | 9°30954  | 26°000 | 0°87 | 9°183  | 26°0     |
| <b>27</b>      | 222°41996  | 1°27 | 4°44 | 1°954  | 10°306 | 10°30954 | 27°000 | 1°87 | 10°183 | 27°0     |
| <b>28</b>      | 243°99107  | 0°30 | 0°93 | 2°954  | 11°306 | 11°30954 | 28°000 | 2°87 | 11°183 | 28°0     |
| <b>29</b>      | 265°56218  | 1°30 | 1°93 | 3°954  | 12°306 | 12°30954 | 29°000 | 3°87 | 12°183 | 29°0     |
| <b>30</b>      | 287°13329  | 0°32 | 2°93 | 4°954  | 13°306 | 13°30954 | 30°000 | 4°87 | 13°183 | 30°0     |
| <b>Feb. 31</b> | 308°70440  | 1°32 | 3°93 | 5°954  | 14°306 | 14°30954 | 31°000 | 5°87 | 14°183 | 31°0     |
| <b>1</b>       | 330°27551  | 0°34 | 0°42 | 6°954  | 15°306 | 15°30954 | 32°000 | 6°87 | 15°183 | 32°0     |
| <b>2</b>       | 351°84662  | 1°34 | 1°42 | 7°954  | 16°306 | 16°30954 | 33°000 | 7°87 | 16°183 | 33°0     |
| <b>3</b>       | 13°41773   | 0°36 | 2°42 | 8°954  | 0°611  | 0°61909  | 34°000 | 0°49 | 0°366  | 34°0     |
| <b>4</b>       | 34°98884   | 1°36 | 3°42 | 9°954  | 1°611  | 1°61909  | 35°000 | 1°49 | 1°366  | 35°0     |
| <b>5</b>       | 56°55995   | 0°38 | 4°42 | 10°954 | 2°611  | 2°61909  | 36°000 | 2°49 | 2°366  | 36°0     |
| <b>6</b>       | 78°13106   | 1°38 | 0°91 | 11°954 | 3°611  | 3°61909  | 37°000 | 3°49 | 3°366  | 37°0     |
| <b>7</b>       | 99°70217   | 0°40 | 1°91 | 0°430  | 4°611  | 4°61909  | 38°000 | 4°49 | 4°366  | 38°0     |
| <b>8</b>       | 121°27328  | 1°40 | 2°91 | 1°430  | 5°611  | 5°61909  | 39°000 | 5°49 | 5°366  | 39°0     |
| <b>9</b>       | 142°84439  | 0°42 | 3°91 | 2°430  | 6°611  | 6°61909  | 40°000 | 6°49 | 6°366  | 40°0     |
| <b>10</b>      | 164°41549  | 1°42 | 0°40 | 3°430  | 7°611  | 7°61909  | 41°000 | 7°49 | 7°366  | 41°0     |
| <b>11</b>      | 185°98660  | 0°44 | 1°40 | 4°430  | 8°611  | 8°61909  | 42°000 | 0°12 | 8°366  | 42°0     |
| <b>12</b>      | 207°55771  | 1°44 | 2°40 | 5°430  | 9°611  | 9°61909  | 43°000 | 1°12 | 9°366  | 43°0     |
| <b>13</b>      | 229°12882  | 0°46 | 3°40 | 6°430  | 10°611 | 10°61909 | 44°000 | 2°12 | 10°366 | 44°0     |
| <b>14</b>      | 250°69993  | 1°46 | 4°40 | 7°430  | 11°611 | 11°61909 | 45°000 | 3°12 | 11°366 | 45°0     |
| <b>15</b>      | 272°27104  | 0°49 | 0°89 | 8°430  | 12°611 | 12°61909 | 46°000 | 4°12 | 12°366 | 46°0     |
| <b>16</b>      | 293°84215  | 1°49 | 1°89 | 9°430  | 13°611 | 13°61909 | 47°000 | 5°12 | 13°366 | 47°0     |
| <b>17</b>      | 315°41326  | 0°51 | 2°89 | 10°430 | 14°611 | 14°61909 | 48°000 | 6°12 | 14°366 | 48°0     |
| <b>18</b>      | 336°98437  | 1°51 | 3°89 | 11°430 | 15°611 | 15°61909 | 49°000 | 7°12 | 15°366 | 49°0     |
| <b>19</b>      | 358°55548  | 0°53 | 0°38 | 12°430 | 16°611 | 16°61909 | 50°000 | 8°12 | 16°366 | 50°0     |
| <b>20</b>      | 20°12659   | 1°53 | 1°38 | 0°907  | 0°917  | 0°92863  | 0°842  | 0°74 | 0°549  | 51°0     |
| <b>21</b>      | 41°69770   | 0°55 | 2°38 | 1°907  | 1°917  | 1°92863  | 1°842  | 1°74 | 1°549  | 52°0     |
| <b>22</b>      | 63°26881   | 1°55 | 3°38 | 2°907  | 2°917  | 2°92863  | 2°842  | 2°74 | 2°549  | 53°0     |

In Leap Year diminish the date in Columns 1, 2, by 1 day after Feb. 28.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### X Motions of Mean Longitude and the Arguments for Days

|     |    | 3   | 4        | 5     | 6    | 7       | 8      | 9     |       |       |       |
|-----|----|-----|----------|-------|------|---------|--------|-------|-------|-------|-------|
| Day |    | I   | J        | K     | L    | M       | N      | O     | P     | Q     | R     |
|     |    | y   |          |       |      |         |        |       |       |       | d     |
| Jan | 1  | 00  | 1 00 0   | 1 000 | 1 0  | 1 00 0  | 1 0 0  | 1 0   | 1 0   | 1 00  | 1 0   |
|     | 2  | 00  | 00000    | 0 0   | 0    | 0       | 2 0 0  | 0     | 00    | 2 0   | 2 0   |
|     | 3  | 0   | 3 000    | 3 000 | 3 0  | 3 0     | 3 000  | 3 0   | 3     | 3 0   | 3 0   |
|     | 4  | 00  | 4 0      | 4     | 4 00 | 4 000   | 4 00   | 4 00  | 4 00  | 4 00  | 4 0   |
|     | 5  | 0   | 5 0000   | 5 0   | 5 0  | 5 0000  | 5 000  | 5 0   | 5 0   | 5 00  | 5 0   |
|     | 6  | 00  | 6 00 0   | 6 0 0 | 6 00 | 6 0 0   | 6 0 0  | 6 00  | 6 0   | 6 00  | 6 00  |
|     | 7  | 00  | 7 00 00  | 7 0 0 | 7 00 | 7 00 0  | 7 00   | 7 0   | 7 0   | 7 0   | 7 0   |
|     | 8  | 0   | 8 00000  | 8 000 | 8 0  | 8 0 0   | 8 0    | 8 0   | 8     | 8 0   | 8 0   |
|     | 9  | 00  | 0 656    | 0 656 | 0 66 | 9 0000  | 9 00   | 9 0   | 9 0   | 9 0   | 9 0   |
|     | 10 | 00  | 10 0 00  | 1 656 | 1 66 | 10 0000 | 10 0   | 10 00 | 1 00  | 1 00  | 10 00 |
|     | 11 | 0   | 11 0 0   | 656   | 2 66 | 11 0 00 | 11 00  | 11 00 | 11 0  | 11 0  | 11 0  |
|     | 12 | 00  | 1 00     | 3 656 | 3 66 | 1 0000  | 1 000  | 12 00 | 12 00 | 12 00 | 12 00 |
|     | 13 | 00  | 13 00000 | 4 656 | 4 66 | 13 0 0  | 13 000 | 13 00 | 13 00 | 13 00 | 13 00 |
|     | 14 | 00  | 14 000 0 | 5 656 | 5 66 | 14 0000 | 14 000 | 14 0  | 14 0  | 14 00 | 14 0  |
|     | 15 | 00  | 15 000 0 | 6 656 | 6 66 | 15 0000 | 15 000 | 15 00 | 15    | 15 0  | 15 00 |
|     | 16 | 0   | 16 0 000 | 7 656 | 7 66 | 16 0000 | 16 00  | 16 00 | 16 00 | 16 00 | 16 00 |
|     | 17 | 0   | 0 31098  | 0 312 | 0 31 | 0 31 4  | 0 316  | 18    | 0 1   | 0 38  | 0 25  |
|     | 18 | 0   | 1 31098  | 1 312 | 1 31 | 1 31 4  | 1 316  | 1 18  | 1 12  | 1 38  | 1 25  |
|     | 19 | 0 1 | 2 31098  | 31    | 2 31 | 2 31 4  | 2 316  | 2 18  | 2 12  | 38    | 2 25  |
|     | 20 | 0 1 | 3 31098  | 3 31  | 3 31 | 3 3124  | 3 316  | 3 18  | 3 12  | 3 38  | 3 25  |
|     | 21 | 0 1 | 4 31098  | 4 312 | 4 31 | 4 31 4  | 4 316  | 4 18  | 4 1   | 4 38  | 4 25  |
|     | 22 | 0 1 | 5 31 98  | 5 312 | 5 31 | 5 31 4  | 5 316  | 5 18  | 5 12  | 5 38  | 5 25  |
|     | 23 | 0 1 | 6 31098  | 6 312 | 6 31 | 6 31 4  | 6 316  | 6 18  | 6 1   | 6 38  | 6 25  |
|     | 24 | 0 1 | 7 31098  | 7 31  | 7 31 | 7 31 4  | 7 316  | 7 18  | 7 1   | 7 38  | 7 5   |
|     | 25 | 0 1 | 8 31098  | 8 312 | 8 31 | 8 3124  | 8 316  | 8 18  | 8 12  | 8 38  | 8 5   |
|     | 26 | 0 1 | 9 31098  | 0 968 | 0 97 | 9 3124  | 9 316  | 9 18  | 9 12  | 9 38  | 9 5   |
|     | 27 | 0 1 | 10 31 98 | 1 968 | 1 97 | 10 3124 | 10 316 | 10 18 | 10 1  | 10 38 | 1 25  |
|     | 28 | 0 1 | 11 31098 | 968   | 2 97 | 11 31 4 | 11 316 | 11 18 | 11 1  | 11 38 | 11 25 |
|     | 29 | 0 1 | 1 31098  | 3 968 | 3 97 | 1 3124  | 12 316 | 12 18 | 12 1  | 1 38  | 12 25 |
|     | 30 | 0 1 | 13 31098 | 4 968 | 4 97 | 13 3124 | 13 316 | 13 18 | 13 12 | 13 38 | 13 25 |
|     | 31 | 0 1 | 14 31098 | 5 968 | 5 97 | 14 3124 | 14 316 | 14 18 | 14 12 | 14 38 | 14 5  |
| Feb | 1  | 0 1 | 15 31 98 | 6 968 | 6 97 | 15 31 4 | 15 316 | 15 18 | 15 12 | 15 38 | 15 25 |
|     | 2  | 0 1 | 16 31098 | 7 968 | 7 97 | 16 31 4 | 16 316 | 16 18 | 16 12 | 16 38 | 16 25 |
|     | 3  | 0 1 | 0 62197  | 0 6 3 | 0 63 | 0 6 47  | 0 633  | 0 36  | 0 3   | 0 75  | 0 49  |
|     | 4  | 0 1 | 1 6 197  | 1 6 3 | 1 63 | 1 6247  | 1 633  | 1 36  | 1 3   | 1 75  | 1 49  |
|     | 5  | 0 1 | 6 197    | 2 623 | 2 63 | 6 47    | 633    | 2 36  | 2 3   | 75    | 2 49  |
|     | 6  | 0 1 | 3 6 197  | 3 623 | 3 63 | 3 6 47  | 3 633  | 3 36  | 3 23  | 3 75  | 3 49  |
|     | 7  | 0 1 | 4 62197  | 4 6 3 | 4 63 | 4 6 47  | 4 633  | 4 36  | 4 23  | 4 75  | 4 49  |
|     | 8  | 0 1 | 5 6 197  | 5 623 | 5 63 | 5 6 47  | 5 633  | 5 36  | 5 23  | 5 75  | 5 49  |
|     | 9  | 0 1 | 6 62197  | 6 623 | 6 63 | 6 6 47  | 6 633  | 6 36  | 6 3   | 6 75  | 6 49  |
|     | 10 | 0 1 | 7 6 197  | 7 623 | 7 63 | 7 6 47  | 7 633  | 7 36  | 7 23  | 7 75  | 7 49  |
|     | 11 | 1   | 8 6 197  | 79    | 28   | 8 6247  | 8 633  | 8 36  | 8 23  | 8 75  | 8 49  |
|     | 12 | 1   | 9 6 197  | 1 279 | 1 8  | 9 6 47  | 9 633  | 9 36  | 9 23  | 9 75  | 9 49  |
|     | 13 | 0 1 | 10 6 197 | 2 79  | 28   | 10 6 47 | 10 633 | 10 36 | 10 23 | 10 75 | 10 49 |
|     | 14 | 0 1 | 11 6 197 | 3 79  | 3 8  | 11 6247 | 11 633 | 11 36 | 11 23 | 11 75 | 11 49 |
|     | 15 | 0 1 | 1 6 197  | 4 79  | 4 8  | 1 6247  | 12 633 | 12 36 | 12 3  | 12 75 | 1 49  |
|     | 16 | 0 1 | 13 6 197 | 5 279 | 5 8  | 13 6 47 | 13 633 | 13 36 | 13 23 | 13 75 | 13 49 |
|     | 17 | 0 1 | 14 6 197 | 6 79  | 6 28 | 14 6247 | 14 633 | 14 36 | 14 23 | 14 75 | 14 49 |
|     | 18 | 0 1 | 15 6 197 | 7 79  | 7 28 | 15 6247 | 15 633 | 15 36 | 15 23 | 15 75 | 15 49 |
|     | 19 | 0 1 | 16 6 197 | 8 79  | 8 28 | 16 6 47 | 16 633 | 16 36 | 16 3  | 0 13  | 16 49 |
|     | 20 | 1   | 93 95    | 0 935 | 0 94 | 0 9371  | 0 949  | 54    | 0 35  | 1 13  | 0 74  |
|     | 21 | 0 1 | 1 93295  | 1 935 | 1 94 | 1 9371  | 1 949  | 1 54  | 1 35  | 2 13  | 1 74  |
|     | 22 | 0 1 | 93295    | 2 935 | 2 94 | 2 9371  | 949    | 2 54  | 35    | 3 13  | 74    |

I L p Y dlm l i h t h d t i C l m by d y f t F b 8

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1              | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day            | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | $\alpha$     |
|                | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>Feb. 23</b> | 84°83992     | 0°57         | 4°38         | 3°907        | 3°917        | 3°92863      | 3°842        | 3°74         | 3°549        | 54°0         |
| <b>24</b>      | 106°41103    | 1°57         | 0°87         | 4°907        | 4°917        | 4°92863      | 4°842        | 4°74         | 4°549        | 55°0         |
| <b>25</b>      | 127°98214    | 0°59         | 1°87         | 5°907        | 5°917        | 5°92863      | 5°842        | 5°74         | 5°549        | 56°0         |
| <b>26</b>      | 149°55325    | 1°59         | 2°87         | 6°907        | 6°917        | 6°92863      | 6°842        | 6°74         | 6°549        | 57°0         |
| <b>27</b>      | 171°12436    | 0°61         | 3°87         | 7°907        | 7°917        | 7°92863      | 7°842        | 7°74         | 7°549        | 58°0         |
| <b>28</b>      | 192°69547    | 1°61         | 0°36         | 8°907        | 8°917        | 8°92863      | 8°842        | 0°36         | 8°549        | 59°0         |
| <b>Mar. 1</b>  | 214°26658    | 0°63         | 1°36         | 9°907        | 9°917        | 9°92863      | 9°842        | 1°36         | 9°549        | 60°0         |
| <b>2</b>       | 235°83769    | 1°63         | 2°36         | 10°907       | 10°917       | 10°92863     | 10°842       | 2°36         | 10°549       | 61°0         |
| <b>3</b>       | 257°40880    | 0°65         | 3°36         | 11°907       | 11°917       | 11°92863     | 11°842       | 3°36         | 11°549       | 62°0         |
| <b>4</b>       | 278°97991    | 1°65         | 4°36         | 0°384        | 12°917       | 12°92863     | 12°842       | 4°36         | 12°549       | 63°0         |
| <b>5</b>       | 300°55102    | 0°67         | 0°85         | 1°384        | 13°917       | 13°92863     | 13°842       | 5°36         | 13°549       | 64°0         |
| <b>6</b>       | 322°12213    | 1°67         | 1°85         | 2°384        | 14°917       | 14°92863     | 14°842       | 6°36         | 14°549       | 65°0         |
| <b>7</b>       | 343°69324    | 0°70         | 2°85         | 3°384        | 15°917       | 15°92863     | 15°842       | 7°36         | 15°549       | 66°0         |
| <b>8</b>       | 5°26435      | 1°70         | 3°85         | 4°384        | 0°223        | 0°23817      | 16°842       | 8°36         | 16°549       | 67°0         |
| <b>9</b>       | 26°83545     | 0°72         | 0°33         | 5°384        | 1°223        | 1°23817      | 17°842       | 0°99         | 0°731        | 68°0         |
| <b>10</b>      | 48°40656     | 1°72         | 1°33         | 6°384        | 2°223        | 2°23817      | 18°842       | 1°99         | 1°731        | 69°0         |
| <b>11</b>      | 69°97767     | 0°74         | 2°33         | 7°384        | 3°223        | 3°23817      | 19°842       | 2°99         | 2°731        | 70°0         |
| <b>12</b>      | 91°54878     | 1°74         | 3°33         | 8°384        | 4°223        | 4°23817      | 20°842       | 3°99         | 3°731        | 71°0         |
| <b>13</b>      | 113°11989    | 0°76         | 4°33         | 9°384        | 5°223        | 5°23817      | 21°842       | 4°99         | 4°731        | 72°0         |
| <b>14</b>      | 134°69100    | 1°76         | 0°82         | 10°384       | 6°223        | 6°23817      | 22°842       | 5°99         | 5°731        | 73°0         |
| <b>15</b>      | 156°26211    | 0°78         | 1°82         | 11°384       | 7°223        | 7°23817      | 23°842       | 6°99         | 6°731        | 74°0         |
| <b>16</b>      | 177°83322    | 1°78         | 2°82         | 12°384       | 8°223        | 8°23817      | 24°842       | 7°99         | 7°731        | 75°0         |
| <b>17</b>      | 199°40433    | 0°80         | 3°82         | 0°861        | 9°223        | 9°23817      | 25°842       | 0°61         | 8°731        | 76°0         |
| <b>18</b>      | 220°97544    | 1°80         | 0°31         | 1°861        | 10°223       | 10°23817     | 26°842       | 1°61         | 9°731        | 77°0         |
| <b>19</b>      | 242°54655    | 0°82         | 1°31         | 2°861        | 11°223       | 11°23817     | 27°842       | 2°61         | 10°731       | 78°0         |
| <b>20</b>      | 264°11766    | 1°82         | 2°31         | 3°861        | 12°223       | 12°23817     | 28°842       | 3°61         | 11°731       | 79°0         |
| <b>21</b>      | 285°68877    | 0°84         | 3°31         | 4°861        | 13°223       | 13°23817     | 29°842       | 4°61         | 12°731       | 80°0         |
| <b>22</b>      | 307°25988    | 1°84         | 4°31         | 5°861        | 14°223       | 14°23817     | 30°842       | 5°61         | 13°731       | 81°0         |
| <b>23</b>      | 328°83099    | 0°86         | 0°80         | 6°861        | 15°223       | 15°23817     | 31°842       | 6°61         | 14°731       | 82°0         |
| <b>24</b>      | 350°40210    | 1°86         | 1°80         | 7°861        | 16°223       | 16°23817     | 32°842       | 7°61         | 15°731       | 83°0         |
| <b>25</b>      | 11°97321     | 0°89         | 2°80         | 8°861        | 0°528        | 0°54772      | 33°842       | 0°23         | 16°731       | 84°0         |
| <b>26</b>      | 33°54432     | 1°89         | 3°80         | 9°861        | 1°528        | 1°54772      | 34°842       | 1°23         | 0°914        | 85°0         |
| <b>27</b>      | 55°11543     | 0°91         | 0°29         | 10°861       | 2°528        | 2°54772      | 35°842       | 2°23         | 1°914        | 86°0         |
| <b>28</b>      | 76°68654     | 1°91         | 1°29         | 11°861       | 3°528        | 3°54772      | 36°842       | 3°23         | 2°914        | 87°0         |
| <b>29</b>      | 98°25765     | 0°93         | 2°29         | 0°337        | 4°528        | 4°54772      | 37°842       | 4°23         | 3°914        | 88°0         |
| <b>30</b>      | 119°82876    | 1°93         | 3°29         | 1°337        | 5°528        | 5°54772      | 38°842       | 5°23         | 4°914        | 89°0         |
| <b>31</b>      | 141°39987    | 0°95         | 4°29         | 2°337        | 6°528        | 6°54772      | 39°842       | 6°23         | 5°914        | 90°0         |
| <b>April 1</b> | 162°97098    | 1°95         | 0°78         | 3°337        | 7°528        | 7°54772      | 40°842       | 7°23         | 6°914        | 91°0         |
| <b>2</b>       | 184°54209    | 0°97         | 1°78         | 4°337        | 8°528        | 8°54772      | 41°842       | 8°23         | 7°914        | 92°0         |
| <b>3</b>       | 206°11320    | 1°97         | 2°78         | 5°337        | 9°528        | 9°54772      | 42°842       | 0°86         | 8°914        | 93°0         |
| <b>4</b>       | 227°68431    | 0°99         | 3°78         | 6°337        | 10°528       | 10°54772     | 43°842       | 1°86         | 9°914        | 94°0         |
| <b>5</b>       | 249°25541    | 0°01         | 0°27         | 7°337        | 11°528       | 11°54772     | 44°842       | 2°86         | 10°914       | 95°0         |
| <b>6</b>       | 270°82652    | 1°01         | 1°27         | 8°337        | 12°528       | 12°54772     | 45°842       | 3°86         | 11°914       | 96°0         |
| <b>7</b>       | 292°39763    | 0°03         | 2°27         | 9°337        | 13°528       | 13°54772     | 46°842       | 4°86         | 12°914       | 97°0         |
| <b>8</b>       | 313°96874    | 1°03         | 3°27         | 10°337       | 14°528       | 14°54772     | 47°842       | 5°86         | 13°914       | 98°0         |
| <b>9</b>       | 335°53985    | 0°05         | 4°27         | 11°337       | 15°528       | 15°54772     | 48°842       | 6°86         | 14°914       | 99°0         |
| <b>10</b>      | 357°11096    | 1°05         | 0°76         | 12°337       | 16°528       | 16°54772     | 49°842       | 7°86         | 15°914       | 100°0        |
| <b>11</b>      | 18°68207     | 0°08         | 1°76         | 0°814        | 0°834        | 0°85726      | 0°684        | 0°48         | 0°097        | 101°0        |
| <b>12</b>      | 40°25318     | 1°08         | 2°76         | 1°814        | 1°834        | 1°85726      | 1°684        | 1°48         | 1°097        | 102°0        |
| <b>13</b>      | 61°82429     | 0°10         | 3°76         | 2°814        | 2°834        | 2°85726      | 2°684        | 2°48         | 2°097        | 103°0        |
| <b>14</b>      | 83°39540     | 1°10         | 0°25         | 3°814        | 3°834        | 3°85726      | 3°684        | 3°48         | 3°097        | 104°0        |
| <b>15</b>      | 104°96651    | 0°12         | 1°25         | 4°814        | 4°834        | 4°85726      | 4°684        | 4°48         | 4°097        | 105°0        |
| <b>16</b>      | 126°53762    | 1°12         | 2°25         | 5°814        | 5°834        | 5°85726      | 5°684        | 5°48         | 5°097        | 106°0        |

In Leap Year diminish the date in Columns 1, 12, by 1 day after Feb. 28.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

|                | 3   | 4         | 5     | 6    | 7       | 8      | 9     |       |       |       |
|----------------|-----|-----------|-------|------|---------|--------|-------|-------|-------|-------|
| D y            | I   | J         | K     | L    | M       | N      | O     | P     | Q     | R     |
|                |     |           |       |      |         |        |       | d     | d     | d     |
| <b>Feb 23</b>  | 0 1 | 3 93 95   | 3 935 | 3 94 | 3 9371  | 3 949  | 3 54  | 3 35  | 4 13  | 3 74  |
| <b>24</b>      | 0 2 | 4 93 95   | 4 935 | 4 94 | 4 9371  | 4 949  | 4 54  | 4 35  | 5 13  | 4 74  |
| <b>25</b>      | 0 2 | 5 93 95   | 5 935 | 5 94 | 5 9371  | 5 949  | 5 54  | 5 35  | 6 13  | 5 74  |
| <b>26</b>      | 0   | 6 93 95   | 6 935 | 6 94 | 6 9371  | 6 949  | 6 54  | 6 35  | 7 13  | 6 74  |
| <b>27</b>      |     | 7 93 95   | 7 935 | 7 94 | 7 9371  | 7 949  | 7 54  | 7 35  | 8 13  | 7 74  |
| <b>28</b>      | 0 2 | 8 93 95   | 5 91  | 0 60 | 8 9371  | 8 949  | 8 54  | 8 35  | 9 13  | 8 74  |
| <b>Mar 1</b>   | 0   | 9 93 95   | 1 591 | 1 6  | 9 9371  | 9 949  | 9 54  | 9 35  | 10 13 | 9 74  |
| <b>2</b>       | 2   | 10 93 95  | 5 91  | 6    | 10 9371 | 10 949 | 1 54  | 1 35  | 11 13 | 10 74 |
| <b>3</b>       | 0   | 11 93 95  | 3 591 | 3 60 | 11 9371 | 11 949 | 11 54 | 11 35 | 12 13 | 11 74 |
| <b>4</b>       | 0 2 | 12 93 295 | 4 591 | 4 6  | 1 9371  | 1 949  | 1 54  | 1 35  | 13 13 | 12 74 |
| <b>5</b>       | 0 2 | 13 93 95  | 5 591 | 5 60 | 13 9371 | 13 949 | 13 54 | 13 35 | 14 13 | 13 74 |
| <b>6</b>       | 0   | 14 93 95  | 6 591 | 6 60 | 14 9371 | 14 949 | 14 54 | 14 35 | 15 13 | 14 74 |
| <b>7</b>       | 0   | 15 93 95  | 7 591 | 7 60 | 15 9371 | 15 949 | 15 54 | 15 35 | 16 13 | 15 74 |
| <b>8</b>       | 0 2 | 0 24394   | 0 47  | 0 5  | 0 495   | 0 66   | 16 54 | 16 35 | 0 50  | 16 74 |
| <b>9</b>       | 0   | 1 24394   | 1 47  | 1 25 | 1 495   | 1 266  | 0 73  | 0 46  | 1 50  | 0 99  |
| <b>10</b>      |     | 2 4394    | 47    | 25   | 495     | 266    | 1 73  | 1 46  | 2 50  | 1 99  |
| <b>11</b>      | 0 2 | 3 4394    | 3 47  | 3 25 | 3 2495  | 3 266  | 73    | 2 46  | 3 50  | 99    |
| <b>12</b>      | 0 2 | 4 24394   | 4 47  | 4 25 | 4 2495  | 4 66   | 3 73  | 3 46  | 4 50  | 3 99  |
| <b>13</b>      | 0 2 | 5 4394    | 5 47  | 5 25 | 5 495   | 5 66   | 4 73  | 4 46  | 5 50  | 4 99  |
| <b>14</b>      | 0   | 6 4394    | 6 47  | 6 25 | 6 2495  | 6 266  | 5 73  | 5 46  | 6 50  | 5 99  |
| <b>15</b>      | 0 2 | 7 24394   | 7 247 | 7 5  | 7 2495  | 7 66   | 6 73  | 6 46  | 7 50  | 6 99  |
| <b>16</b>      | 0   | 8 4394    | 8 47  | 8 25 | 8 2495  | 8 266  | 7 73  | 7 46  | 8 50  | 7 99  |
| <b>17</b>      | 0 2 | 9 24394   | 0 9 3 | 91   | 9 2495  | 9 266  | 8 73  | 8 46  | 9 5   | 8 99  |
| <b>18</b>      | 0 2 | 10 24394  | 1 903 | 1 91 | 10 2495 | 10 66  | 9 73  | 9 46  | 10 50 | 9 99  |
| <b>19</b>      | 0 2 | 11 4394   | 903   | 2 91 | 11 2495 | 11 266 | 10 73 | 10 46 | 11 50 | 10 99 |
| <b>20</b>      | 0 2 | 12 24394  | 3 903 | 3 91 | 1 495   | 12 66  | 11 73 | 11 46 | 1 50  | 11 99 |
| <b>21</b>      | 0   | 13 4394   | 4 903 | 4 91 | 13 2495 | 13 66  | 1 73  | 12 46 | 13 50 | 1 99  |
| <b>22</b>      | 0   | 14 24394  | 5 903 | 5 91 | 14 2495 | 14 66  | 13 73 | 13 46 | 14 50 | 13 99 |
| <b>23</b>      | 2   | 15 4394   | 6 903 | 6 91 | 15 2495 | 15 66  | 14 73 | 14 46 | 15 50 | 14 99 |
| <b>24</b>      | 0   | 16 4394   | 7 903 | 7 91 | 16 495  | 16 66  | 15 73 | 15 46 | 16 50 | 15 99 |
| <b>25</b>      | 0 2 | 0 55492   | 558   | 0 57 | 0 5618  | 0 582  | 16 73 | 16 46 | 0 88  | 0 3   |
| <b>26</b>      | 0   | 1 5549    | 1 558 | 1 57 | 1 5618  | 1 582  | 0 91  | 0 58  | 1 88  | 1 23  |
| <b>27</b>      | 0 2 | 2 55492   | 558   | 57   | 2 5618  | 2 58   | 1 91  | 1 58  | 88    | 2 3   |
| <b>28</b>      | 0 2 | 3 5549    | 3 558 | 3 57 | 3 5618  | 3 582  | 2 91  | 58    | 3 88  | 3 23  |
| <b>29</b>      | 0 2 | 4 55492   | 4 558 | 4 57 | 4 5618  | 4 582  | 3 91  | 3 58  | 4 88  | 4 23  |
| <b>30</b>      |     | 5 5549    | 5 558 | 5 57 | 5 5618  | 5 58   | 4 91  | 4 58  | 5 88  | 5 23  |
| <b>31</b>      | 0   | 6 55492   | 6 558 | 6 57 | 6 5618  | 6 58   | 5 91  | 5 58  | 6 88  | 6 3   |
| <b>April 1</b> | 0 2 | 7 55492   | 7 558 | 7 57 | 7 5618  | 7 58   | 6 91  | 6 58  | 7 88  | 7 3   |
| <b>2</b>       | 0 3 | 8 5549    | 0 14  | 0 3  | 8 5618  | 8 58   | 7 91  | 7 58  | 8 88  | 8 23  |
| <b>3</b>       | 0 3 | 9 5549    | 1 214 | 1 23 | 9 5618  | 9 58   | 8 91  | 8 58  | 9 88  | 9 23  |
| <b>4</b>       | 0 3 | 10 5549   | 14    | 2 3  | 10 5618 | 10 582 | 9 91  | 9 58  | 1 88  | 10 3  |
| <b>5</b>       | 0 3 | 11 55492  | 3 214 | 3 23 | 11 5618 | 11 582 | 1 91  | 10 58 | 11 88 | 11 23 |
| <b>6</b>       | 0 3 | 1 5549    | 4 14  | 4 23 | 12 5618 | 1 582  | 11 91 | 11 58 | 1 88  | 12 23 |
| <b>7</b>       | 3   | 13 5549   | 5 14  | 5 23 | 13 5618 | 13 58  | 1 91  | 12 58 | 13 88 | 13 23 |
| <b>8</b>       | 0 3 | 14 5549   | 6 214 | 6 3  | 14 5618 | 14 58  | 13 91 | 13 58 | 14 88 | 14 23 |
| <b>9</b>       | 3   | 15 55492  | 7 14  | 7 3  | 15 5618 | 15 582 | 14 91 | 14 58 | 15 88 | 15 3  |
| <b>10</b>      | 0 3 | 16 5549   | 8 14  | 8 3  | 16 5618 | 16 582 | 15 91 | 15 58 | 0 5   | 16 3  |
| <b>11</b>      | 0 3 | 86590     | 0 870 | 0 88 | 0 874   | 0 898  | 0 09  | 16 58 | 1 25  | 0 48  |
| <b>12</b>      | 0 3 | 1 86590   | 1 87  | 1 88 | 1 8742  | 1 898  | 1 09  | 0 70  | 2 5   | 1 48  |
| <b>13</b>      | 0 3 | 8659      | 2 870 | 88   | 2 8742  | 2 898  | 09    | 1 70  | 3 25  | 2 48  |
| <b>14</b>      | 0 3 | 3 86590   | 3 870 | 3 88 | 3 874   | 3 898  | 3 09  | 2 70  | 4 5   | 3 48  |
| <b>15</b>      | 0 3 | 4 8659    | 4 870 | 4 88 | 4 874   | 4 898  | 4 09  | 3 70  | 5 25  | 4 48  |
| <b>16</b>      | 0 3 | 5 8659    | 5 870 | 5 88 | 5 8742  | 5 898  | 5 09  | 4 70  | 6 25  | 5 48  |

I L p Y d i m i l h t d t i O l m by d y f t F b 8

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 1               | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           |
|-----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day             | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | $\alpha$     |
|                 | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>April 17</b> | 148°10873    | 0°14         | 3°25         | 6°814        | 6°834        | 6°85726      | 6°684        | 6°48         | 6°097        | 107°0        |
| <b>18</b>       | 169°67984    | 1°14         | 4°25         | 7°814        | 7°834        | 7°85726      | 7°684        | 7°48         | 7°097        | 108°0        |
| <b>19</b>       | 191°25095    | 0°16         | 0°73         | 8°814        | 8°834        | 8°85726      | 8°684        | 0°10         | 8°097        | 109°0        |
| <b>20</b>       | 212°82206    | 1°16         | 1°73         | 9°814        | 9°834        | 9°85726      | 9°684        | 1°10         | 9°097        | 110°0        |
| <b>21</b>       | 234°39317    | 0°18         | 2°73         | 10°814       | 10°834       | 10°85726     | 10°684       | 2°10         | 10°097       | 111°0        |
| <b>22</b>       | 255°96428    | 1°18         | 3°73         | 11°814       | 11°834       | 11°85726     | 11°684       | 3°10         | 11°097       | 112°0        |
| <b>23</b>       | 277°53539    | 0°20         | 0°22         | 0°291        | 12°834       | 12°85726     | 12°684       | 4°10         | 12°097       | 113°0        |
| <b>24</b>       | 299°10650    | 1°20         | 1°22         | 1°291        | 13°834       | 13°85726     | 13°684       | 5°10         | 13°097       | 114°0        |
| <b>25</b>       | 320°67761    | 0°22         | 2°22         | 2°291        | 14°834       | 14°85726     | 14°684       | 6°10         | 14°097       | 115°0        |
| <b>26</b>       | 342°24872    | 1°22         | 3°22         | 3°291        | 15°834       | 15°85726     | 15°684       | 7°10         | 15°097       | 116°0        |
| <b>27</b>       | 3°81983      | 0°24         | 4°22         | 4°291        | 0°139        | 0°16680      | 16°684       | 8°10         | 16°097       | 117°0        |
| <b>28</b>       | 25°39094     | 1°24         | 0°71         | 5°291        | 1°139        | 1°16680      | 17°684       | 0°73         | 0°280        | 118°0        |
| <b>29</b>       | 46°96205     | 0°27         | 1°71         | 6°291        | 2°139        | 2°16680      | 18°684       | 1°73         | 1°280        | 119°0        |
| <b>30</b>       | 68°53316     | 1°27         | 2°71         | 7°291        | 3°139        | 3°16680      | 19°684       | 2°73         | 2°280        | 120°0        |
| <b>May 1</b>    | 90°10426     | 0°29         | 3°71         | 8°291        | 4°139        | 4°16680      | 20°684       | 3°73         | 3°280        | 121°0        |
| <b>2</b>        | 111°67537    | 1°29         | 0°20         | 9°291        | 5°139        | 5°16680      | 21°684       | 4°73         | 4°280        | 122°0        |
| <b>3</b>        | 133°24648    | 0°31         | 1°20         | 10°291       | 6°139        | 6°16680      | 22°684       | 5°73         | 5°280        | 123°0        |
| <b>4</b>        | 154°81759    | 1°31         | 2°20         | 11°291       | 7°139        | 7°16680      | 23°684       | 6°73         | 6°280        | 124°0        |
| <b>5</b>        | 176°38870    | 0°33         | 3°20         | 12°291       | 8°139        | 8°16680      | 24°684       | 7°73         | 7°280        | 125°0        |
| <b>6</b>        | 197°95981    | 1°33         | 4°20         | 0°768        | 9°139        | 9°16680      | 25°684       | 0°35         | 8°280        | 126°0        |
| <b>7</b>        | 219°53092    | 0°35         | 0°69         | 1°768        | 10°139       | 10°16680     | 26°684       | 1°35         | 9°280        | 127°0        |
| <b>8</b>        | 241°10203    | 1°35         | 1°69         | 2°768        | 11°139       | 11°16680     | 27°684       | 2°35         | 10°280       | 128°0        |
| <b>9</b>        | 262°67314    | 0°37         | 2°69         | 3°768        | 12°139       | 12°16680     | 28°684       | 3°35         | 11°280       | 129°0        |
| <b>10</b>       | 284°24425    | 1°37         | 3°69         | 4°768        | 13°139       | 13°16680     | 29°684       | 4°35         | 12°280       | 130°0        |
| <b>11</b>       | 305°81536    | 0°39         | 0°18         | 5°768        | 14°139       | 14°16680     | 30°684       | 5°35         | 13°280       | 131°0        |
| <b>12</b>       | 327°38647    | 1°39         | 1°18         | 6°768        | 15°139       | 15°16680     | 31°684       | 6°35         | 14°280       | 132°0        |
| <b>13</b>       | 348°95758    | 0°41         | 2°18         | 7°768        | 16°139       | 16°16680     | 32°684       | 7°35         | 15°280       | 133°0        |
| <b>14</b>       | 10°52869     | 1°41         | 3°18         | 8°768        | 0°445        | 0°47635      | 33°684       | 8°35         | 16°280       | 134°0        |
| <b>15</b>       | 32°09980     | 0°43         | 4°18         | 9°768        | 1°445        | 1°47635      | 34°684       | 0°97         | 0°463        | 135°0        |
| <b>16</b>       | 53°67091     | 1°43         | 0°67         | 10°768       | 2°445        | 2°47635      | 35°684       | 1°97         | 1°463        | 136°0        |
| <b>17</b>       | 75°24202     | 0°46         | 1°67         | 11°768       | 3°445        | 3°47635      | 36°684       | 2°97         | 2°463        | 137°0        |
| <b>18</b>       | 96°81313     | 1°46         | 2°67         | 0°244        | 4°445        | 4°47635      | 37°684       | 3°97         | 3°463        | 138°0        |
| <b>19</b>       | 118°38424    | 0°48         | 3°67         | 1°244        | 5°445        | 5°47635      | 38°684       | 4°97         | 4°463        | 139°0        |
| <b>20</b>       | 139°95535    | 1°48         | 0°16         | 2°244        | 6°445        | 6°47635      | 39°684       | 5°97         | 5°463        | 140°0        |
| <b>21</b>       | 161°52646    | 0°50         | 1°16         | 3°244        | 7°445        | 7°47635      | 40°684       | 6°97         | 6°463        | 141°0        |
| <b>22</b>       | 183°09757    | 1°50         | 2°16         | 4°244        | 8°445        | 8°47635      | 41°684       | 7°97         | 7°463        | 142°0        |
| <b>23</b>       | 204°66868    | 0°52         | 3°16         | 5°244        | 9°445        | 9°47635      | 42°684       | 0°59         | 8°463        | 143°0        |
| <b>24</b>       | 226°23979    | 1°52         | 4°16         | 6°244        | 10°445       | 10°47635     | 43°684       | 1°59         | 9°463        | 144°0        |
| <b>25</b>       | 247°81090    | 0°54         | 0°65         | 7°244        | 11°445       | 11°47635     | 44°684       | 2°59         | 10°463       | 145°0        |
| <b>26</b>       | 269°38201    | 1°54         | 1°65         | 8°244        | 12°445       | 12°47635     | 45°684       | 3°59         | 11°463       | 146°0        |
| <b>27</b>       | 290°95312    | 0°56         | 2°65         | 9°244        | 13°445       | 13°47635     | 46°684       | 4°59         | 12°463       | 147°0        |
| <b>28</b>       | 312°52423    | 1°56         | 3°65         | 10°244       | 14°445       | 14°47635     | 47°684       | 5°59         | 13°463       | 148°0        |
| <b>29</b>       | 334°09533    | 0°58         | 0°13         | 11°244       | 15°445       | 15°47635     | 48°684       | 6°59         | 14°463       | 149°0        |
| <b>30</b>       | 355°66644    | 1°58         | 1°13         | 12°244       | 16°445       | 16°47635     | 49°684       | 7°59         | 15°463       | 150°0        |
| <b>31</b>       | 17°23755     | 0°60         | 2°13         | 0°721        | 0°751        | 0°78589      | 0°526        | 0°22         | 16°463       | 151°0        |
| <b>June 1</b>   | 38°80866     | 1°60         | 3°13         | 1°721        | 1°751        | 1°78589      | 1°526        | 1°22         | 0°646        | 152°0        |
| <b>2</b>        | 60°37977     | 0°62         | 4°13         | 2°721        | 2°751        | 2°78589      | 2°526        | 2°22         | 1°646        | 153°0        |
| <b>3</b>        | 81°95088     | 1°62         | 0°62         | 3°721        | 3°751        | 3°78589      | 3°526        | 3°22         | 2°646        | 154°0        |
| <b>4</b>        | 103°52199    | 0°65         | 1°62         | 4°721        | 4°751        | 4°78589      | 4°526        | 4°22         | 3°646        | 155°0        |
| <b>5</b>        | 125°09310    | 1°65         | 2°62         | 5°721        | 5°751        | 5°78589      | 5°526        | 5°22         | 4°646        | 156°0        |
| <b>6</b>        | 146°66421    | 0°67         | 3°62         | 6°721        | 6°751        | 6°78589      | 6°526        | 6°22         | 5°646        | 157°0        |
| <b>7</b>        | 168°23532    | 1°67         | 0°11         | 7°721        | 7°751        | 7°78589      | 7°526        | 7°22         | 6°646        | 158°0        |

In Leap Year diminish the date in Columns 1, 2, by 1 day after Feb. 28.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

|                 | 3  | 4       | 5    | 6   | 7      | 8     | 9    |          |         |          |
|-----------------|----|---------|------|-----|--------|-------|------|----------|---------|----------|
| Day             | I  | J       | K    | L   | M      | N     | O    | P        | Q       | R        |
| <b>April 17</b> | 03 | 68659   | 6870 | 688 | 6874   | 6898  | 609  | d<br>570 | d<br>75 | d<br>648 |
| <b>18</b>       | 03 | 78659   | 7870 | 788 | 7874   | 7898  | 709  | 67       | 85      | 748      |
| <b>19</b>       | 03 | 886590  | 56   | 054 | 8874   | 8898  | 809  | 77       | 95      | 848      |
| <b>20</b>       | 3  | 986590  | 156  | 154 | 9874   | 9898  | 909  | 870      | 1025    | 948      |
| <b>21</b>       | 03 | 1086590 | 56   | 254 | 108742 | 10898 | 1009 | 97       | 115     | 1048     |
| <b>22</b>       | 03 | 1186590 | 3526 | 354 | 118742 | 11898 | 1109 | 1070     | 125     | 1148     |
| <b>23</b>       | 3  | 186590  | 456  | 454 | 128742 | 12898 | 109  | 117      | 135     | 1248     |
| <b>24</b>       | 03 | 1386590 | 556  | 554 | 13874  | 13898 | 1309 | 120      | 145     | 1348     |
| <b>25</b>       | 03 | 148659  | 656  | 654 | 14874  | 14898 | 149  | 1370     | 1525    | 1448     |
| <b>26</b>       | 03 | 158659  | 756  | 754 | 158742 | 15898 | 1509 | 1470     | 165     | 1548     |
| <b>27</b>       | 03 | 017689  | 018  | 020 | 01866  | 015   | 1609 | 1570     | 063     | 1648     |
| <b>28</b>       | 03 | 117689  | 118  | 10  | 11866  | 115   | 07   | 1670     | 163     | 073      |
| <b>29</b>       | 03 | 17689   | 2182 | 20  | 1866   | 15    | 17   | 081      | 63      | 173      |
| <b>30</b>       | 3  | 317689  | 318  | 30  | 31866  | 315   | 27   | 181      | 363     | 273      |
| <b>May 1</b>    | 3  | 417689  | 4182 | 420 | 41866  | 4215  | 327  | 81       | 463     | 373      |
| <b>2</b>        | 03 | 517689  | 518  | 520 | 51866  | 515   | 427  | 381      | 563     | 473      |
| <b>3</b>        | 03 | 617689  | 618  | 6   | 61866  | 615   | 57   | 481      | 663     | 573      |
| <b>4</b>        | 03 | 717689  | 718  | 7   | 71866  | 7215  | 67   | 581      | 763     | 673      |
| <b>5</b>        | 03 | 817689  | 8182 | 820 | 81866  | 8215  | 727  | 681      | 863     | 773      |
| <b>6</b>        | 03 | 917689  | 0838 | 085 | 91866  | 915   | 87   | 781      | 963     | 873      |
| <b>7</b>        | 03 | 1017689 | 1838 | 185 | 101866 | 10215 | 97   | 881      | 1063    | 973      |
| <b>8</b>        | 04 | 1117689 | 2838 | 285 | 111866 | 11215 | 1027 | 981      | 1163    | 1073     |
| <b>9</b>        | 04 | 117689  | 3838 | 385 | 121866 | 12215 | 1127 | 1081     | 1263    | 1173     |
| <b>10</b>       | 04 | 1317689 | 4838 | 485 | 131866 | 13215 | 17   | 1181     | 1363    | 1273     |
| <b>11</b>       | 04 | 1417689 | 5838 | 585 | 141866 | 1415  | 137  | 1281     | 1463    | 1373     |
| <b>12</b>       | 04 | 1517689 | 6838 | 685 | 151866 | 1515  | 1427 | 1381     | 1563    | 1473     |
| <b>13</b>       | 04 | 1617689 | 7838 | 785 | 161866 | 1615  | 1527 | 1481     | 000     | 1573     |
| <b>14</b>       | 04 | 048787  | 0493 | 051 | 04990  | 0531  | 1627 | 1581     | 100     | 1673     |
| <b>15</b>       | 04 | 148787  | 1493 | 151 | 14990  | 1531  | 045  | 1681     | 00      | 97       |
| <b>16</b>       | 04 | 48787   | 2493 | 251 | 24990  | 531   | 145  | 093      | 300     | 197      |
| <b>17</b>       | 04 | 348787  | 3493 | 351 | 34990  | 3531  | 45   | 193      | 400     | 297      |
| <b>18</b>       | 04 | 448787  | 4493 | 451 | 4499   | 4531  | 345  | 293      | 500     | 397      |
| <b>19</b>       | 04 | 548787  | 5493 | 551 | 54990  | 5531  | 445  | 393      | 600     | 497      |
| <b>20</b>       | 04 | 648787  | 6493 | 651 | 6499   | 6531  | 545  | 493      | 700     | 597      |
| <b>21</b>       | 04 | 748787  | 7493 | 751 | 74990  | 7531  | 645  | 593      | 800     | 697      |
| <b>22</b>       | 04 | 848787  | 0149 | 017 | 84990  | 8531  | 745  | 693      | 900     | 797      |
| <b>23</b>       | 04 | 948787  | 1149 | 117 | 94990  | 9531  | 845  | 793      | 1000    | 897      |
| <b>24</b>       | 04 | 148787  | 2149 | 17  | 104990 | 1531  | 945  | 893      | 1100    | 997      |
| <b>25</b>       | 4  | 1148787 | 3149 | 317 | 114990 | 11531 | 1045 | 993      | 100     | 1097     |
| <b>26</b>       | 04 | 148787  | 4149 | 417 | 124990 | 1531  | 1145 | 1093     | 130     | 1197     |
| <b>27</b>       | 04 | 1348787 | 5149 | 517 | 134990 | 13531 | 145  | 1193     | 1400    | 197      |
| <b>28</b>       | 04 | 1448787 | 6149 | 617 | 144990 | 14531 | 1345 | 193      | 1500    | 1397     |
| <b>29</b>       | 04 | 1548787 | 7149 | 717 | 154990 | 15531 | 1445 | 1393     | 1600    | 1497     |
| <b>30</b>       | 04 | 1648787 | 8149 | 817 | 164990 | 16531 | 1545 | 1493     | 038     | 1597     |
| <b>31</b>       | 04 | 79885   | 85   | 08  | 08113  | 0848  | 1645 | 1593     | 138     |          |
| <b>June 1</b>   | 04 | 179885  | 185  | 18  | 18113  | 1848  | 063  | 004      | 238     | 122      |
| <b>2</b>        | 4  | 279885  | 85   | 82  | 8113   | 2848  | 163  | 14       | 338     |          |
| <b>3</b>        | 4  | 379885  | 3805 | 38  | 38113  | 3848  | 263  | 204      | 438     | 3        |
| <b>4</b>        | 04 | 479885  | 4805 | 482 | 48113  | 4848  | 363  | 304      | 538     | 42       |
| <b>5</b>        | 04 | 579885  | 5805 | 58  | 58113  | 5848  | 463  | 404      | 638     | 52       |
| <b>6</b>        | 4  | 679885  | 685  | 68  | 68113  | 6848  | 563  | 504      | 738     | 6        |
| <b>7</b>        | 04 | 779885  | 785  | 78  | 78113  | 7848  | 663  | 604      | 838     | 72       |

I L p Y d i m i l t l d t i O l by d y f t h b s

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

*X continued* Motions of Mean Longitude and the Arguments for Days

| 1             | 2          | 3    | 4    | 5      | 6      | 7        | 8      | 9    | 10     | 11       |
|---------------|------------|------|------|--------|--------|----------|--------|------|--------|----------|
| Day           | Mean Long. | A    | B    | C      | D      | E        | F      | G    | H      | $\alpha$ |
|               | °          | d    | d    | d      | d      | d        | d      | d    | d      | d        |
| <b>June 8</b> | 189°80643  | 0°69 | 1°11 | 8°721  | 8°751  | 8°78589  | 8°526  | 8°22 | 7°646  | 159°0    |
| <b>9</b>      | 211°37754  | 1°69 | 2°11 | 9°721  | 9°751  | 9°78589  | 9°526  | 0°84 | 8°646  | 160°0    |
| <b>10</b>     | 232°94865  | 0°71 | 3°11 | 10°721 | 10°751 | 10°78589 | 10°526 | 1°84 | 9°646  | 161°0    |
| <b>11</b>     | 254°51976  | 1°71 | 4°11 | 11°721 | 11°751 | 11°78589 | 11°526 | 2°84 | 10°646 | 162°0    |
| <b>12</b>     | 276°09087  | 0°73 | 0°60 | 0°198  | 12°751 | 12°78589 | 12°526 | 3°84 | 11°646 | 163°0    |
| <b>13</b>     | 297°66198  | 1°73 | 1°60 | 1°198  | 13°751 | 13°78589 | 13°526 | 4°84 | 12°646 | 164°0    |
| <b>14</b>     | 319°23309  | 0°75 | 2°60 | 2°198  | 14°751 | 14°78589 | 14°526 | 5°84 | 13°646 | 165°0    |
| <b>15</b>     | 340°80420  | 1°75 | 3°60 | 3°198  | 15°751 | 15°78589 | 15°526 | 6°84 | 14°646 | 166°0    |
| <b>16</b>     | 2°37531    | 0°77 | 0°09 | 4°198  | 0°056  | 0°09543  | 16°526 | 7°84 | 15°646 | 167°0    |
| <b>17</b>     | 23°94642   | 1°77 | 1°09 | 5°198  | 1°056  | 1°09543  | 17°526 | 0°46 | 16°646 | 168°0    |
| <b>18</b>     | 45°51753   | 0°79 | 2°09 | 6°198  | 2°056  | 2°09543  | 18°526 | 1°46 | 0°829  | 169°0    |
| <b>19</b>     | 67°08864   | 1°79 | 3°09 | 7°198  | 3°056  | 3°09543  | 19°526 | 2°46 | 1°829  | 170°0    |
| <b>20</b>     | 88°65975   | 0°81 | 4°09 | 8°198  | 4°056  | 4°09543  | 20°526 | 3°46 | 2°829  | 171°0    |
| <b>21</b>     | 110°23086  | 1°81 | 0°58 | 9°198  | 5°056  | 5°09543  | 21°526 | 4°46 | 3°829  | 172°0    |
| <b>22</b>     | 131°80197  | 0°83 | 1°58 | 10°198 | 6°056  | 6°09543  | 22°526 | 5°46 | 4°829  | 173°0    |
| <b>23</b>     | 153°37308  | 1°83 | 2°58 | 11°198 | 7°056  | 7°09543  | 23°526 | 6°46 | 5°829  | 174°0    |
| <b>24</b>     | 174°94419  | 0°86 | 3°58 | 12°198 | 8°056  | 8°09543  | 24°526 | 7°46 | 6°829  | 175°0    |
| <b>25</b>     | 196°51529  | 1°86 | 0°07 | 0°675  | 9°056  | 9°09543  | 25°526 | 0°09 | 7°829  | 176°0    |
| <b>26</b>     | 218°08640  | 0°88 | 1°07 | 1°675  | 10°056 | 10°09543 | 26°526 | 1°09 | 8°829  | 177°0    |
| <b>27</b>     | 239°65751  | 1°88 | 2°07 | 2°675  | 11°056 | 11°09543 | 27°526 | 2°09 | 9°829  | 178°0    |
| <b>28</b>     | 261°22862  | 0°90 | 3°07 | 3°675  | 12°056 | 12°09543 | 28°526 | 3°09 | 10°829 | 179°0    |
| <b>29</b>     | 282°79973  | 1°90 | 4°07 | 4°675  | 13°056 | 13°09543 | 29°526 | 4°09 | 11°829 | 180°0    |
| <b>30</b>     | 304°37084  | 0°92 | 0°56 | 5°675  | 14°056 | 14°09543 | 30°526 | 5°09 | 12°829 | 181°0    |
| <b>July 1</b> | 325°94195  | 1°92 | 1°56 | 6°675  | 15°056 | 15°09543 | 31°526 | 6°09 | 13°829 | 182°0    |
| <b>2</b>      | 347°51306  | 0°94 | 2°56 | 7°675  | 16°056 | 16°09543 | 32°526 | 7°09 | 14°829 | 183°0    |
| <b>3</b>      | 9°08417    | 1°94 | 3°56 | 8°675  | 0°362  | 0°40498  | 33°526 | 8°09 | 15°829 | 184°0    |
| <b>4</b>      | 30°65528   | 0°96 | 0°05 | 9°675  | 1°362  | 1°40498  | 34°526 | 0°71 | 0°012  | 185°0    |
| <b>5</b>      | 52°22639   | 1°96 | 1°05 | 10°675 | 2°362  | 2°40498  | 35°526 | 1°71 | 1°012  | 186°0    |
| <b>6</b>      | 73°79750   | 0°98 | 2°05 | 11°675 | 3°362  | 3°40498  | 36°526 | 2°71 | 2°012  | 187°0    |
| <b>7</b>      | 95°36861   | 0°00 | 3°05 | 0°151  | 4°362  | 4°40498  | 37°526 | 3°71 | 3°012  | 188°0    |
| <b>8</b>      | 116°93972  | 1°00 | 4°05 | 1°151  | 5°362  | 5°40498  | 38°526 | 4°71 | 4°012  | 189°0    |
| <b>9</b>      | 138°51083  | 0°02 | 0°54 | 2°151  | 6°362  | 6°40498  | 39°526 | 5°71 | 5°012  | 190°0    |
| <b>10</b>     | 160°08194  | 1°02 | 1°54 | 3°151  | 7°362  | 7°40498  | 40°526 | 6°71 | 6°012  | 191°0    |
| <b>11</b>     | 181°65305  | 0°05 | 2°54 | 4°151  | 8°362  | 8°40498  | 41°526 | 7°71 | 7°012  | 192°0    |
| <b>12</b>     | 203°22416  | 1°05 | 3°54 | 5°151  | 9°362  | 9°40498  | 42°526 | 0°33 | 8°012  | 193°0    |
| <b>13</b>     | 224°79527  | 0°07 | 0°02 | 6°151  | 10°362 | 10°40498 | 43°526 | 1°33 | 9°012  | 194°0    |
| <b>14</b>     | 246°36638  | 1°07 | 1°02 | 7°151  | 11°362 | 11°40498 | 44°526 | 2°33 | 10°012 | 195°0    |
| <b>15</b>     | 267°93749  | 0°09 | 2°02 | 8°151  | 12°362 | 12°40498 | 45°526 | 3°33 | 11°012 | 196°0    |
| <b>16</b>     | 289°50860  | 1°09 | 3°02 | 9°151  | 13°362 | 13°40498 | 46°526 | 4°33 | 12°012 | 197°0    |
| <b>17</b>     | 311°07971  | 0°11 | 4°02 | 10°151 | 14°362 | 14°40498 | 47°526 | 5°33 | 13°012 | 198°0    |
| <b>18</b>     | 332°65082  | 1°11 | 0°51 | 11°151 | 15°362 | 15°40498 | 48°526 | 6°33 | 14°012 | 199°0    |
| <b>19</b>     | 354°22193  | 0°13 | 1°51 | 12°151 | 16°362 | 16°40498 | 49°526 | 7°33 | 15°012 | 200°0    |
| <b>20</b>     | 15°79304   | 1°13 | 2°51 | 0°628  | 0°668  | 0°71452  | 0°368  | 8°33 | 16°012 | 201°0    |
| <b>21</b>     | 37°36415   | 0°15 | 3°51 | 1°628  | 1°668  | 1°71452  | 1°368  | 0°96 | 0°194  | 202°0    |
| <b>22</b>     | 58°93525   | 1°15 | 0°00 | 2°628  | 2°668  | 2°71452  | 2°368  | 1°96 | 1°194  | 203°0    |
| <b>23</b>     | 80°50636   | 0°17 | 1°00 | 3°628  | 3°668  | 3°71452  | 3°368  | 2°96 | 2°194  | 204°0    |
| <b>24</b>     | 102°07747  | 1°17 | 2°00 | 4°628  | 4°668  | 4°71452  | 4°368  | 3°96 | 3°194  | 205°0    |
| <b>25</b>     | 123°64858  | 0°19 | 3°00 | 5°628  | 5°668  | 5°71452  | 5°368  | 4°96 | 4°194  | 206°0    |
| <b>26</b>     | 145°21969  | 1°19 | 4°00 | 6°628  | 6°668  | 6°71452  | 6°368  | 5°96 | 5°194  | 207°0    |
| <b>27</b>     | 166°79080  | 0°21 | 0°49 | 7°628  | 7°668  | 7°71452  | 7°368  | 6°96 | 6°194  | 208°0    |
| <b>28</b>     | 188°36191  | 1°21 | 1°49 | 8°628  | 8°668  | 8°71452  | 8°368  | 7°96 | 7°194  | 209°0    |
| <b>29</b>     | 209°93302  | 0°24 | 2°49 | 9°628  | 9°668  | 9°71452  | 9°368  | 0°58 | 8°194  | 210°0    |

In Leap Year diminish the date in Columns 1, 12, by 1 day after Feb. 28.



# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

|             | 3            | 4        | 5     | 6            | 7       | 8      | 9            |       |       |       |
|-------------|--------------|----------|-------|--------------|---------|--------|--------------|-------|-------|-------|
| D y         | I            | J        | K     | L            | M       | N      | O            | P     | Q     | R     |
| <b>June</b> | <sup>y</sup> |          |       | <sup>a</sup> |         |        | <sup>a</sup> |       |       |       |
| 8           | 0 4          | 8 79885  | 0 461 | 0 48         | 8 8113  | 8 848  | 7 63         | 7 04  | 9 38  | 8 22  |
| 9           | 4            | 9 79885  | 1 461 | 1 48         | 9 8113  | 9 848  | 8 63         | 8 04  | 10 38 | 9 22  |
| 10          | 0 4          | 10 79885 | 2 461 | 48           | 10 8113 | 1 848  | 9 63         | 9 04  | 11 38 | 1 22  |
| 11          | 4            | 11 79885 | 3 461 | 3 48         | 11 8113 | 11 848 | 10 63        | 10 04 | 12 38 | 11 2  |
| 12          | 4            | 1 79885  | 4 461 | 4 48         | 12 8113 | 1 848  | 11 63        | 11 04 | 13 38 | 12 22 |
| 13          | 0 4          | 13 79885 | 5 461 | 5 48         | 13 8113 | 13 848 | 1 63         | 1 04  | 14 38 | 13 2  |
| 14          | 5            | 14 79885 | 6 461 | 6 48         | 14 8113 | 14 848 | 13 63        | 13 04 | 15 38 | 14 22 |
| 15          | 0 5          | 15 79885 | 7 461 | 7 48         | 15 8113 | 15 848 | 14 63        | 14 04 | 16 38 | 15 22 |
| 16          | 0 5          | 10984    | 0 117 | 14           | 0 1237  | 0 164  | 15 63        | 15 04 | 0 75  | 16    |
| 17          | 0 5          | 1 1 984  | 1 117 | 1 14         | 1 1237  | 1 164  | 16 63        | 16 04 | 1 75  | 46    |
| 18          | 0 5          | 2 10984  | 2 117 | 14           | 2 1237  | 2 164  | 0 81         | 0 16  | 2 75  | 1 46  |
| 19          | 0 5          | 3 10984  | 3 117 | 3 14         | 3 1237  | 3 164  | 1 81         | 1 16  | 3 75  | 2 46  |
| 20          | 0 5          | 4 1 984  | 4 117 | 4 14         | 4 1 37  | 4 164  | 81           | 2 16  | 4 75  | 3 46  |
| 21          | 0 5          | 5 10984  | 5 117 | 5 14         | 5 1237  | 5 164  | 3 81         | 3 16  | 5 75  | 4 46  |
| 22          | 0 5          | 6 1 984  | 6 117 | 6 14         | 6 1 37  | 6 164  | 4 81         | 4 16  | 6 75  | 5 46  |
| 23          | 0 5          | 7 10984  | 7 117 | 7 14         | 7 1 37  | 7 164  | 5 81         | 5 16  | 7 75  | 6 46  |
| 24          | 0 5          | 8 10984  | 8 117 | 8 14         | 8 1237  | 8 164  | 6 81         | 6 16  | 8 75  | 7 46  |
| 25          | 0 5          | 9 10984  | 0 773 | 0 79         | 9 1237  | 9 164  | 7 81         | 7 16  | 9 75  | 8 46  |
| 26          | 0 5          | 10 10984 | 1 773 | 1 79         | 10 1237 | 10 164 | 8 81         | 8 16  | 10 75 | 9 46  |
| 27          | 0 5          | 11 10984 | 2 773 | 79           | 11 1 37 | 11 164 | 9 81         | 9 16  | 11 75 | 10 46 |
| 28          | 0 5          | 12 10984 | 3 773 | 3 79         | 12 1237 | 12 164 | 10 81        | 10 16 | 12 75 | 11 46 |
| 29          | 0 5          | 13 10984 | 4 773 | 4 79         | 13 1 37 | 13 164 | 11 81        | 11 16 | 13 75 | 12 46 |
| 30          | 5            | 14 10984 | 5 773 | 5 79         | 14 1237 | 14 164 | 1 81         | 12 16 | 14 75 | 13 46 |
| <b>July</b> | 1            | 15 10984 | 6 773 | 6 79         | 15 1237 | 15 164 | 13 81        | 13 16 | 15 75 | 14 46 |
| 2           | 0 5          | 16 10984 | 7 773 | 7 79         | 16 1 37 | 16 164 | 14 81        | 14 16 | 0 13  | 15 46 |
| 3           | 0 5          | 0 4 8    | 0 4 8 | 0 45         | 0 4361  | 0 480  | 15 81        | 15 16 | 1 13  | 16 46 |
| 4           | 5            | 1 4 8    | 1 4 8 | 1 45         | 1 4361  | 1 480  | 0 0          | 16 16 | 2 13  | 0 71  |
| 5           | 0 5          | 2 4 82   | 428   | 45           | 2 4361  | 2 480  | 1 00         | 0 27  | 3 13  | 1 71  |
| 6           | 0 5          | 3 4 082  | 3 4 8 | 3 45         | 3 4361  | 3 480  | 2 00         | 1 7   | 4 13  | 71    |
| 7           | 0 5          | 4 42082  | 4 4 8 | 4 45         | 4 4361  | 4 480  | 3 00         | 2 27  | 5 13  | 3 71  |
| 8           | 0 5          | 5 4 82   | 5 428 | 5 45         | 5 4361  | 5 480  | 4 00         | 3 27  | 6 13  | 4 71  |
| 9           | 0 5          | 6 4 082  | 6 4 8 | 6 45         | 6 4361  | 6 480  | 5 00         | 4 27  | 7 13  | 5 71  |
| 10          | 0 5          | 7 4 082  | 7 4 8 | 7 45         | 7 4361  | 7 480  | 6 00         | 5 7   | 8 13  | 6 71  |
| 11          | 0 5          | 8 4 082  | 0 084 | 0 11         | 8 4361  | 8 480  | 7 00         | 6 7   | 9 13  | 7 71  |
| 12          | 0 5          | 9 4 082  | 1 084 | 1 11         | 9 4361  | 9 480  | 8 00         | 7 27  | 10 13 | 8 71  |
| 13          | 0 5          | 10 42082 | 084   | 11           | 10 4361 | 10 480 | 9 00         | 8 27  | 11 13 | 9 71  |
| 14          | 0 5          | 11 4 82  | 3 084 | 3 11         | 11 4361 | 11 480 | 10 0         | 9 27  | 12 13 | 10 71 |
| 15          | 0 5          | 1 4 82   | 4 84  | 4 11         | 12 4361 | 12 480 | 11 0         | 10 7  | 13 13 | 11 71 |
| 16          | 5            | 13 42 8  | 5 084 | 5 11         | 13 4361 | 13 480 | 12 00        | 11 27 | 14 13 | 1 71  |
| 17          | 0 5          | 14 4208  | 6 084 | 6 11         | 14 4361 | 14 480 | 13 00        | 12 7  | 15 13 | 13 71 |
| 18          | 5            | 15 42 82 | 7 084 | 7 11         | 15 4361 | 15 480 | 14 00        | 13 27 | 16 13 | 14 71 |
| 19          | 5            | 16 4 8   | 8 084 | 8 11         | 16 4361 | 16 480 | 15 0         | 14 7  | 0 50  | 15 71 |
| 20          | 0 6          | 73181    | 0 740 | 0 76         | 0 7484  | 0 797  | 16 00        | 15 27 | 1 50  | 16 71 |
| 21          | 0 6          | 1 73181  | 1 740 | 1 76         | 1 7484  | 1 797  | 0 18         | 16 27 | 2 50  | 0 96  |
| 22          | 0 6          | 2 73181  | 740   | 2 76         | 7484    | 797    | 1 18         | 0 39  | 3 50  | 1 96  |
| 23          | 0 6          | 3 73181  | 3 740 | 3 76         | 3 7484  | 3 797  | 18           | 1 39  | 4 50  | 96    |
| 24          | 0 6          | 4 73181  | 4 74  | 4 76         | 4 7484  | 4 797  | 3 18         | 39    | 5 50  | 3 96  |
| 25          | 0 6          | 5 73181  | 5 740 | 5 76         | 5 7484  | 5 797  | 4 18         | 3 39  | 6 5   | 4 96  |
| 26          | 6            | 6 73181  | 6 740 | 6 76         | 6 7484  | 6 797  | 5 18         | 4 39  | 7 50  | 5 96  |
| 27          | 0 6          | 7 73181  | 7 740 | 7 76         | 7 7484  | 7 797  | 6 18         | 5 39  | 8 50  | 6 96  |
| 28          | 0 6          | 8 73181  | 0 396 | 0 4          | 8 7484  | 8 797  | 7 18         | 6 39  | 9 50  | 7 96  |
| 29          | 0 6          | 9 73181  | 1 396 | 1 4          | 9 7484  | 9 797  | 8 18         | 7 39  | 1 5   | 8 96  |



# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

| 1              | 2          | 3    | 4    | 5      | 6      | 7        | 8      | 9    | 10     | 11       |
|----------------|------------|------|------|--------|--------|----------|--------|------|--------|----------|
| Day            | Mean Long. | A    | B    | C      | D      | E        | F      | G    | H      | $\alpha$ |
|                | °          | d    | d    | d      | d      | d        | d      | d    | d      | d        |
| <b>July 30</b> | 231°50413  | 1°24 | 3°49 | 10°628 | 10°668 | 10°71452 | 10°368 | 1°58 | 9°194  | 211°0    |
| <b>31</b>      | 253°07524  | 0°26 | 4°49 | 11°628 | 11°668 | 11°71452 | 11°368 | 2°58 | 10°194 | 212°0    |
| <b>Aug. 1</b>  | 274°64635  | 1°26 | 0°98 | 0°105  | 12°668 | 12°71452 | 12°368 | 3°58 | 11°194 | 213°0    |
| <b>2</b>       | 296°21746  | 0°28 | 1°98 | 1°105  | 13°668 | 13°71452 | 13°368 | 4°58 | 12°194 | 214°0    |
| <b>3</b>       | 317°78857  | 1°28 | 2°98 | 2°105  | 14°668 | 14°71452 | 14°368 | 5°58 | 13°194 | 215°0    |
| <b>4</b>       | 339°35968  | 0°30 | 3°98 | 3°105  | 15°668 | 15°71452 | 15°368 | 6°58 | 14°194 | 216°0    |
| <b>5</b>       | 0°93079    | 1°30 | 0°47 | 4°105  | 16°668 | 0°02406  | 16°368 | 7°58 | 15°194 | 217°0    |
| <b>6</b>       | 22°50190   | 0°32 | 1°47 | 5°105  | 0°973  | 1°02406  | 17°368 | 0°20 | 16°194 | 218°0    |
| <b>7</b>       | 44°07301   | 1°32 | 2°47 | 6°105  | 1°973  | 2°02406  | 18°368 | 1°20 | 0°377  | 219°0    |
| <b>8</b>       | 65°64412   | 0°34 | 3°47 | 7°105  | 2°973  | 3°02406  | 19°368 | 2°20 | 1°377  | 220°0    |
| <b>9</b>       | 87°21523   | 1°34 | 4°47 | 8°105  | 3°973  | 4°02406  | 20°368 | 3°20 | 2°377  | 221°0    |
| <b>10</b>      | 108°78634  | 0°36 | 0°96 | 9°105  | 4°973  | 5°02406  | 21°368 | 4°20 | 3°377  | 222°0    |
| <b>11</b>      | 130°35745  | 1°36 | 1°96 | 10°105 | 5°973  | 6°02406  | 22°368 | 5°20 | 4°377  | 223°0    |
| <b>12</b>      | 151°92856  | 0°38 | 2°96 | 11°105 | 6°973  | 7°02406  | 23°368 | 6°20 | 5°377  | 224°0    |
| <b>13</b>      | 173°49967  | 1°38 | 3°96 | 12°105 | 7°973  | 8°02406  | 24°368 | 7°20 | 6°377  | 225°0    |
| <b>14</b>      | 195°07078  | 0°40 | 0°45 | 0°582  | 8°973  | 9°02406  | 25°368 | 8°20 | 7°377  | 226°0    |
| <b>15</b>      | 216°64189  | 1°40 | 1°45 | 1°582  | 9°973  | 10°02406 | 26°368 | 0°83 | 8°377  | 227°0    |
| <b>16</b>      | 238°21300  | 0°43 | 2°45 | 2°582  | 10°973 | 11°02406 | 27°368 | 1°83 | 9°377  | 228°0    |
| <b>17</b>      | 259°78411  | 1°43 | 3°45 | 3°582  | 11°973 | 12°02406 | 28°368 | 2°83 | 10°377 | 229°0    |
| <b>18</b>      | 281°35521  | 0°45 | 4°45 | 4°582  | 12°973 | 13°02406 | 29°368 | 3°83 | 11°377 | 230°0    |
| <b>19</b>      | 302°92632  | 1°45 | 0°94 | 5°582  | 13°973 | 14°02406 | 30°368 | 4°83 | 12°377 | 231°0    |
| <b>20</b>      | 324°49743  | 0°47 | 1°94 | 6°582  | 14°973 | 15°02406 | 31°368 | 5°83 | 13°377 | 232°0    |
| <b>21</b>      | 346°06854  | 1°47 | 2°94 | 7°582  | 15°973 | 16°02406 | 32°368 | 6°83 | 14°377 | 233°0    |
| <b>22</b>      | 7°63965    | 0°49 | 3°94 | 8°582  | 0°279  | 0°33361  | 33°368 | 7°83 | 15°377 | 234°0    |
| <b>23</b>      | 29°21076   | 1°49 | 0°42 | 9°582  | 1°279  | 1°33361  | 34°368 | 0°45 | 16°377 | 235°0    |
| <b>24</b>      | 50°78187   | 0°51 | 1°42 | 10°582 | 2°279  | 2°33361  | 35°368 | 1°45 | 0°560  | 236°0    |
| <b>25</b>      | 72°35298   | 1°51 | 2°42 | 11°582 | 3°279  | 3°33361  | 36°368 | 2°45 | 1°560  | 237°0    |
| <b>26</b>      | 93°92409   | 0°53 | 3°42 | 0°058  | 4°279  | 4°33361  | 37°368 | 3°45 | 2°560  | 238°0    |
| <b>27</b>      | 115°49520  | 1°53 | 4°42 | 1°058  | 5°279  | 5°33361  | 38°368 | 4°45 | 3°560  | 239°0    |
| <b>28</b>      | 137°06631  | 0°55 | 0°91 | 2°058  | 6°279  | 6°33361  | 39°368 | 5°45 | 4°560  | 240°0    |
| <b>29</b>      | 158°63742  | 1°55 | 1°91 | 3°058  | 7°279  | 7°33361  | 40°368 | 6°45 | 5°560  | 241°0    |
| <b>30</b>      | 180°20853  | 0°57 | 2°91 | 4°058  | 8°279  | 8°33361  | 41°368 | 7°45 | 6°560  | 242°0    |
| <b>31</b>      | 201°77964  | 1°57 | 3°91 | 5°058  | 9°279  | 9°33361  | 42°368 | 0°07 | 7°560  | 243°0    |
| <b>Sept. 1</b> | 223°35075  | 0°59 | 0°40 | 6°058  | 10°279 | 10°33361 | 43°368 | 1°07 | 8°560  | 244°0    |
| <b>2</b>       | 244°92186  | 1°59 | 1°40 | 7°058  | 11°279 | 11°33361 | 44°368 | 2°07 | 9°560  | 245°0    |
| <b>3</b>       | 266°49297  | 0°62 | 2°40 | 8°058  | 12°279 | 12°33361 | 45°368 | 3°07 | 10°560 | 246°0    |
| <b>4</b>       | 288°06408  | 1°62 | 3°40 | 9°058  | 13°279 | 13°33361 | 46°368 | 4°07 | 11°560 | 247°0    |
| <b>5</b>       | 309°63519  | 0°64 | 4°40 | 10°058 | 14°279 | 14°33361 | 47°368 | 5°07 | 12°560 | 248°0    |
| <b>6</b>       | 331°20630  | 1°64 | 0°89 | 11°058 | 15°279 | 15°33361 | 48°368 | 6°07 | 13°560 | 249°0    |
| <b>7</b>       | 352°77741  | 0°66 | 1°89 | 12°058 | 16°279 | 16°33361 | 49°368 | 7°07 | 14°560 | 250°0    |
| <b>8</b>       | 14°34852   | 1°66 | 2°89 | 0°535  | 0°584  | 0°64315  | 0°211  | 8°07 | 15°560 | 251°0    |
| <b>9</b>       | 35°91963   | 0°68 | 3°89 | 1°535  | 1°584  | 1°64315  | 1°211  | 0°70 | 16°560 | 252°0    |
| <b>10</b>      | 57°49074   | 1°68 | 0°38 | 2°535  | 2°584  | 2°64315  | 2°211  | 1°70 | 0°743  | 253°0    |
| <b>11</b>      | 79°06185   | 0°70 | 1°38 | 3°535  | 3°584  | 3°64315  | 3°211  | 2°70 | 1°743  | 254°0    |
| <b>12</b>      | 100°63296  | 1°70 | 2°38 | 4°535  | 4°584  | 4°64315  | 4°211  | 3°70 | 2°743  | 255°0    |
| <b>13</b>      | 122°20407  | 0°72 | 3°38 | 5°535  | 5°584  | 5°64315  | 5°211  | 4°70 | 3°743  | 256°0    |
| <b>14</b>      | 143°77517  | 1°72 | 4°38 | 6°535  | 6°584  | 6°64315  | 6°211  | 5°70 | 4°743  | 257°0    |
| <b>15</b>      | 165°34628  | 0°74 | 0°87 | 7°535  | 7°584  | 7°64315  | 7°211  | 6°70 | 5°743  | 258°0    |
| <b>16</b>      | 186°91739  | 1°74 | 1°87 | 8°535  | 8°584  | 8°64315  | 8°211  | 7°70 | 6°743  | 259°0    |
| <b>17</b>      | 208°48850  | 0°76 | 2°87 | 9°535  | 9°584  | 9°64315  | 9°211  | 0°32 | 7°743  | 260°0    |
| <b>18</b>      | 230°05961  | 1°76 | 3°87 | 10°535 | 10°584 | 10°64315 | 10°211 | 1°32 | 8°743  | 261°0    |
| <b>19</b>      | 251°63072  | 0°78 | 0°36 | 11°535 | 11°584 | 11°64315 | 11°211 | 2°32 | 9°743  | 262°0    |

In Leap Year diminish the date in Columns 1, 2, by 1 day after Feb. 28.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

*X continued*

Motions of Mean Longitude and the Arguments for Days

|                | 3   | 4        | 5            | 6            | 7       | 8      | 9            |       |       |              |
|----------------|-----|----------|--------------|--------------|---------|--------|--------------|-------|-------|--------------|
| Day            | I   | J        | K            | L            | M       | N      | O            | P     | Q     | R            |
|                |     |          | <sup>a</sup> | <sup>a</sup> |         |        | <sup>a</sup> |       |       | <sup>a</sup> |
| <b>July 30</b> | 0 6 | 1 73181  | 2 396        | 42           | 1 7484  | 10 797 | 9 18         | 8 39  | 11 5  | 9 96         |
| <b>31</b>      | 6   | 11 73181 | 3 396        | 3 4          | 11 7484 | 11 797 | 10 18        | 9 39  | 1 50  | 10 96        |
| <b>Aug 1</b>   | 0 6 | 1 73181  | 4 396        | 4 42         | 1 7484  | 1 797  | 11 18        | 10 39 | 13 5  | 11 96        |
| <b>2</b>       | 0 6 | 13 73181 | 5 396        | 5 4          | 13 7484 | 13 797 | 1 18         | 11 39 | 14 50 | 12 96        |
| <b>3</b>       | 6   | 14 73181 | 6 396        | 6 4          | 14 7484 | 14 797 | 13 18        | 12 39 | 15 50 | 13 96        |
| <b>4</b>       | 0 6 | 15 73181 | 7 396        | 7 4          | 15 7484 | 15 797 | 14 18        | 13 39 | 16 50 | 14 96        |
| <b>5</b>       | 6   | 0 4279   | 0 5          | 0 08         | 6 8     | 0 113  | 15 18        | 14 39 | 0 88  | 15 96        |
| <b>6</b>       | 0 6 | 1 4 79   | 1 05         | 1 08         | 1 06 8  | 1 113  | 16 18        | 15 39 | 1 88  | 0 20         |
| <b>7</b>       | 0 6 | 4 79     | 0 52         | 0 8          | 0 608   | 1 13   | 0 36         | 16 39 | 88    | 1 0          |
| <b>8</b>       | 0 6 | 3 4279   | 3 052        | 3 08         | 3 0608  | 3 113  | 1 36         | 0 51  | 3 88  | 2 0          |
| <b>9</b>       | 0 6 | 4 04279  | 4 052        | 4 08         | 4 0608  | 4 113  | 2 36         | 1 51  | 4 88  | 3 20         |
| <b>10</b>      | 0 6 | 5 04279  | 5 052        | 5 8          | 5 0608  | 5 113  | 3 36         | 2 51  | 5 88  | 4 20         |
| <b>11</b>      | 0 6 | 6 4 79   | 6 05         | 6 08         | 6 06 8  | 6 113  | 4 36         | 3 51  | 6 88  | 5 20         |
| <b>12</b>      | 0 6 | 7 4 79   | 7 05         | 7 08         | 7 608   | 7 113  | 5 36         | 4 51  | 7 88  | 6 0          |
| <b>13</b>      | 0 6 | 8 04 79  | 8 052        | 8 08         | 8 0608  | 8 113  | 6 36         | 5 51  | 8 88  | 7 20         |
| <b>14</b>      | 0 6 | 9 04279  | 0 708        | 0 73         | 9 06 8  | 9 113  | 7 36         | 6 51  | 9 88  | 8 20         |
| <b>15</b>      | 0 6 | 10 04 79 | 1 708        | 1 73         | 10 06 8 | 10 113 | 8 36         | 7 51  | 10 88 | 9 2          |
| <b>16</b>      | 0 6 | 11 04279 | 708          | 2 73         | 11 0608 | 11 113 | 9 36         | 8 51  | 11 88 | 10 20        |
| <b>17</b>      | 0 6 | 1 04 79  | 3 708        | 3 73         | 12 0608 | 12 113 | 10 36        | 9 51  | 12 88 | 11 20        |
| <b>18</b>      | 0 6 | 13 04279 | 4 708        | 4 73         | 13 608  | 13 113 | 11 36        | 10 51 | 13 88 | 12 20        |
| <b>19</b>      | 0 6 | 14 04279 | 5 7 8        | 5 73         | 14 0608 | 14 113 | 12 36        | 11 51 | 14 88 | 13 20        |
| <b>20</b>      | 0 6 | 15 04 79 | 6 708        | 6 73         | 15 608  | 15 113 | 13 36        | 12 51 | 15 88 | 14 20        |
| <b>21</b>      | 0 6 | 16 04279 | 7 708        | 7 73         | 16 0608 | 16 113 | 14 36        | 13 51 | 0 25  | 15 0         |
| <b>22</b>      | 0 6 | 0 35377  | 0 363        | 0 39         | 0 3732  | 0 43   | 15 36        | 14 51 | 1 25  | 16 20        |
| <b>23</b>      | 0 6 | 1 35377  | 1 363        | 1 39         | 1 3732  | 1 43   | 16 36        | 15 51 | 2 25  | 0 45         |
| <b>24</b>      | 0 6 | 2 35377  | 3 63         | 2 39         | 3 73    | 2 430  | 0 54         | 16 51 | 3 25  | 1 45         |
| <b>25</b>      | 0 6 | 3 35377  | 3 363        | 3 39         | 3 373   | 3 430  | 1 54         | 0 62  | 4 25  | 45           |
| <b>26</b>      | 7   | 4 35377  | 4 363        | 4 39         | 4 3732  | 4 430  | 54           | 1 6   | 5 5   | 3 45         |
| <b>27</b>      | 0 7 | 5 35377  | 5 363        | 5 39         | 5 3732  | 5 430  | 3 54         | 2 6   | 6 25  | 4 45         |
| <b>28</b>      | 7   | 6 35377  | 6 363        | 6 39         | 6 3732  | 6 430  | 4 54         | 3 62  | 7 25  | 5 45         |
| <b>29</b>      | 0 7 | 7 35377  | 7 363        | 7 39         | 7 3732  | 7 430  | 5 54         | 4 62  | 8 5   | 6 45         |
| <b>30</b>      | 0 7 | 8 35377  | 0 019        | 0 05         | 8 3732  | 8 430  | 6 54         | 5 6   | 9 25  | 7 45         |
| <b>31</b>      | 0 7 | 9 35377  | 1 019        | 1 05         | 9 3732  | 9 430  | 7 54         | 6 6   | 10 25 | 8 45         |
| <b>Sept 1</b>  | 0 7 | 1 35377  | 0 19         | 2 05         | 10 3732 | 10 430 | 8 54         | 7 6   | 11 5  | 9 45         |
| <b>2</b>       | 7   | 11 35377 | 3 019        | 3 05         | 11 3732 | 11 430 | 9 54         | 8 62  | 12 25 | 10 45        |
| <b>3</b>       | 0 7 | 1 35377  | 4 19         | 4 5          | 12 373  | 12 430 | 10 54        | 9 62  | 13 25 | 11 45        |
| <b>4</b>       | 7   | 13 35377 | 5 019        | 5 05         | 13 373  | 13 430 | 11 54        | 10 62 | 14 25 | 12 45        |
| <b>5</b>       | 0 7 | 14 35377 | 6 019        | 6 5          | 14 373  | 14 430 | 12 54        | 11 62 | 15 5  | 13 45        |
| <b>6</b>       | 0 7 | 15 35377 | 7 019        | 7 05         | 15 3732 | 15 430 | 13 54        | 12 62 | 16 5  | 14 45        |
| <b>7</b>       | 0 7 | 16 35377 | 8 019        | 8 5          | 16 373  | 16 430 | 14 54        | 13 62 | 0 63  | 15 45        |
| <b>8</b>       | 7   | 0 66476  | 0 675        | 0 71         | 0 6855  | 0 746  | 15 54        | 14 6  | 1 63  | 16 45        |
| <b>9</b>       | 0 7 | 1 66476  | 1 675        | 1 71         | 1 6855  | 1 746  | 16 54        | 15 62 | 2 63  | 70           |
| <b>10</b>      | 0 7 | 2 66476  | 675          | 2 71         | 2 6855  | 746    | 0 72         | 16 6  | 3 63  | 1 7          |
| <b>11</b>      | 0 7 | 3 66476  | 3 675        | 3 71         | 3 6855  | 3 746  | 1 72         | 0 74  | 4 63  | 2 7          |
| <b>12</b>      | 7   | 4 66476  | 4 675        | 4 71         | 4 6855  | 4 746  | 2 72         | 1 74  | 5 63  | 3 70         |
| <b>13</b>      | 0 7 | 5 66476  | 5 675        | 5 71         | 5 6855  | 5 746  | 3 7          | 2 74  | 6 63  | 4 70         |
| <b>14</b>      | 7   | 6 66476  | 6 675        | 6 71         | 6 6855  | 6 746  | 4 72         | 3 74  | 7 63  | 5 70         |
| <b>15</b>      | 0 7 | 7 66476  | 7 675        | 7 71         | 7 6855  | 7 746  | 5 72         | 4 74  | 8 63  | 6 70         |
| <b>16</b>      | 0 7 | 8 66476  | 0 331        | 36           | 8 6855  | 8 746  | 6 72         | 5 74  | 9 63  | 7 70         |
| <b>17</b>      | 0 7 | 9 66476  | 1 331        | 1 36         | 9 6855  | 9 746  | 7 7          | 6 74  | 10 63 | 8 70         |
| <b>18</b>      | 0 7 | 10 66476 | 2 331        | 2 36         | 1 6855  | 10 746 | 8 72         | 7 74  | 11 63 | 9 70         |
| <b>19</b>      | 0 7 | 11 66476 | 3 331        | 3 36         | 11 6855 | 11 746 | 9 72         | 8 74  | 1 63  | 10 7         |

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1               | 2          | 3    | 4    | 5      | 6      | 7        | 8      | 9    | 10     | 11       |
|-----------------|------------|------|------|--------|--------|----------|--------|------|--------|----------|
| Day             | Mean Long. | A    | B    | C      | D      | E        | F      | G    | H      | $\alpha$ |
|                 | °          | d    | d    | d      | d      | d        | d      | d    | d      | d        |
| <b>Sept. 20</b> | 273°20183  | 1°78 | 1°36 | 0°012  | 12°584 | 12°64315 | 12°211 | 3°32 | 10°743 | 263°0    |
| <b>21</b>       | 294°77294  | 0°80 | 2°36 | 1°012  | 13°584 | 13°64315 | 13°211 | 4°32 | 11°743 | 264°0    |
| <b>22</b>       | 316°34405  | 1°80 | 3°36 | 2°012  | 14°584 | 14°64315 | 14°211 | 5°32 | 12°743 | 265°0    |
| <b>23</b>       | 337°91516  | 0°83 | 4°36 | 3°012  | 15°584 | 15°64315 | 15°211 | 6°32 | 13°743 | 266°0    |
| <b>24</b>       | 359°48627  | 1°83 | 0°85 | 4°012  | 16°584 | 16°64315 | 16°211 | 7°32 | 14°743 | 267°0    |
| <b>25</b>       | 21°05738   | 0°85 | 1°85 | 5°012  | 0°890  | 0°95269  | 17°211 | 8°32 | 15°743 | 268°0    |
| <b>26</b>       | 42°62849   | 1°85 | 2°85 | 6°012  | 1°890  | 1°95269  | 18°211 | 0°94 | 16°743 | 269°0    |
| <b>27</b>       | 64°19960   | 0°87 | 3°85 | 7°012  | 2°890  | 2°95269  | 19°211 | 1°94 | 0°926  | 270°0    |
| <b>28</b>       | 85°77071   | 1°87 | 0°34 | 8°012  | 3°890  | 3°95269  | 20°211 | 2°94 | 1°926  | 271°0    |
| <b>29</b>       | 107°34182  | 0°89 | 1°34 | 9°012  | 4°890  | 4°95269  | 21°211 | 3°94 | 2°926  | 272°0    |
| <b>Oct. 30</b>  | 128°91293  | 1°89 | 2°34 | 10°012 | 5°890  | 5°95269  | 22°211 | 4°94 | 3°926  | 273°0    |
| <b>1</b>        | 150°48404  | 0°91 | 3°34 | 11°012 | 6°890  | 6°95269  | 23°211 | 5°94 | 4°926  | 274°0    |
| <b>2</b>        | 172°05515  | 1°91 | 4°34 | 12°012 | 7°890  | 7°95269  | 24°211 | 6°94 | 5°926  | 275°0    |
| <b>3</b>        | 193°62626  | 0°93 | 0°82 | 0°489  | 8°890  | 8°95269  | 25°211 | 7°94 | 6°926  | 276°0    |
| <b>4</b>        | 215°19737  | 1°93 | 1°82 | 1°489  | 9°890  | 9°95269  | 26°211 | 0°57 | 7°926  | 277°0    |
| <b>5</b>        | 236°76848  | 0°95 | 2°82 | 2°489  | 10°890 | 10°95269 | 27°211 | 1°57 | 8°926  | 278°0    |
| <b>6</b>        | 258°33959  | 1°95 | 3°82 | 3°489  | 11°890 | 11°95269 | 28°211 | 2°57 | 9°926  | 279°0    |
| <b>7</b>        | 279°91070  | 0°97 | 0°31 | 4°489  | 12°890 | 12°95269 | 29°211 | 3°57 | 10°926 | 280°0    |
| <b>8</b>        | 301°48181  | 1°97 | 1°31 | 5°489  | 13°890 | 13°95269 | 30°211 | 4°57 | 11°926 | 281°0    |
| <b>9</b>        | 323°05292  | 0°99 | 2°31 | 6°489  | 14°890 | 14°95269 | 31°211 | 5°57 | 12°926 | 282°0    |
| <b>10</b>       | 344°62403  | 0°02 | 3°31 | 7°489  | 15°890 | 15°95269 | 32°211 | 6°57 | 13°926 | 283°0    |
| <b>11</b>       | 6°19513    | 1°02 | 4°31 | 8°489  | 0°196  | 0°26224  | 33°211 | 7°57 | 14°926 | 284°0    |
| <b>12</b>       | 27°76624   | 0°04 | 0°80 | 9°489  | 1°196  | 1°26224  | 34°211 | 0°19 | 15°926 | 285°0    |
| <b>13</b>       | 49°33735   | 1°04 | 1°80 | 10°489 | 2°196  | 2°26224  | 35°211 | 1°19 | 0°109  | 286°0    |
| <b>14</b>       | 70°90846   | 0°06 | 2°80 | 11°489 | 3°196  | 3°26224  | 36°211 | 2°19 | 1°109  | 287°0    |
| <b>15</b>       | 92°47957   | 1°06 | 3°80 | 12°489 | 4°196  | 4°26224  | 37°211 | 3°19 | 2°109  | 288°0    |
| <b>16</b>       | 114°05068  | 0°08 | 0°29 | 0°965  | 5°196  | 5°26224  | 38°211 | 4°19 | 3°109  | 289°0    |
| <b>17</b>       | 135°62179  | 1°08 | 1°29 | 1°965  | 6°196  | 6°26224  | 39°211 | 5°19 | 4°109  | 290°0    |
| <b>18</b>       | 157°19290  | 0°10 | 2°29 | 2°965  | 7°196  | 7°26224  | 40°211 | 6°19 | 5°109  | 291°0    |
| <b>19</b>       | 178°76401  | 1°10 | 3°29 | 3°965  | 8°196  | 8°26224  | 41°211 | 7°19 | 6°109  | 292°0    |
| <b>20</b>       | 200°33512  | 0°12 | 4°29 | 4°965  | 9°196  | 9°26224  | 42°211 | 8°19 | 7°109  | 293°0    |
| <b>21</b>       | 221°90623  | 1°12 | 0°78 | 5°965  | 10°196 | 10°26224 | 43°211 | 0°81 | 8°109  | 294°0    |
| <b>22</b>       | 243°47734  | 0°14 | 1°78 | 6°965  | 11°196 | 11°26224 | 44°211 | 1°81 | 9°109  | 295°0    |
| <b>23</b>       | 265°04845  | 1°14 | 2°78 | 7°965  | 12°196 | 12°26224 | 45°211 | 2°81 | 10°109 | 296°0    |
| <b>24</b>       | 286°61956  | 0°16 | 3°78 | 8°965  | 13°196 | 13°26224 | 46°211 | 3°81 | 11°109 | 297°0    |
| <b>25</b>       | 308°19067  | 1°16 | 0°27 | 9°965  | 14°196 | 14°26224 | 47°211 | 4°81 | 12°109 | 298°0    |
| <b>26</b>       | 329°76178  | 0°18 | 1°27 | 10°965 | 15°196 | 15°26224 | 48°211 | 5°81 | 13°109 | 299°0    |
| <b>27</b>       | 351°33289  | 1°18 | 2°27 | 11°965 | 16°196 | 16°26224 | 49°211 | 6°81 | 14°109 | 300°0    |
| <b>28</b>       | 12°90400   | 0°21 | 3°27 | 0°442  | 0°501  | 0°57178  | 0°052  | 7°81 | 15°109 | 301°0    |
| <b>29</b>       | 34°47511   | 1°21 | 4°27 | 1°442  | 1°501  | 1°57178  | 1°052  | 0°44 | 16°109 | 302°0    |
| <b>30</b>       | 56°04622   | 0°23 | 0°76 | 2°442  | 2°501  | 2°57178  | 2°052  | 1°44 | 0°292  | 303°0    |
| <b>Nov. 31</b>  | 77°61733   | 1°23 | 1°76 | 3°442  | 3°501  | 3°57178  | 3°052  | 2°44 | 1°292  | 304°0    |
| <b>1</b>        | 99°18844   | 0°25 | 2°76 | 4°442  | 4°501  | 4°57178  | 4°052  | 3°44 | 2°292  | 305°0    |
| <b>2</b>        | 120°75955  | 1°25 | 3°76 | 5°442  | 5°501  | 5°57178  | 5°052  | 4°44 | 3°292  | 306°0    |
| <b>3</b>        | 142°33066  | 0°27 | 0°25 | 6°442  | 6°501  | 6°57178  | 6°052  | 5°44 | 4°292  | 307°0    |
| <b>4</b>        | 163°90177  | 1°27 | 1°25 | 7°442  | 7°501  | 7°57178  | 7°052  | 6°44 | 5°292  | 308°0    |
| <b>5</b>        | 185°47288  | 0°29 | 2°25 | 8°442  | 8°501  | 8°57178  | 8°052  | 7°44 | 6°292  | 309°0    |
| <b>6</b>        | 207°04399  | 1°29 | 3°25 | 9°442  | 9°501  | 9°57178  | 9°052  | 0°06 | 7°292  | 310°0    |
| <b>7</b>        | 228°61509  | 0°31 | 4°25 | 10°442 | 10°501 | 10°57178 | 10°052 | 1°06 | 8°292  | 311°0    |
| <b>8</b>        | 250°18620  | 1°31 | 0°74 | 11°442 | 11°501 | 11°57178 | 11°052 | 2°06 | 9°292  | 312°0    |
| <b>9</b>        | 271°75731  | 0°33 | 1°74 | 12°442 | 12°501 | 12°57178 | 12°052 | 3°06 | 10°292 | 313°0    |
| <b>10</b>       | 293°32842  | 1°33 | 2°74 | 0°919  | 13°501 | 13°57178 | 13°052 | 4°06 | 11°292 | 314°0    |

In Leap Year diminish the date in Columns 1, 12, by 1 day after Feb. 28.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

|                | 3  | 4        | 5     | 6    | 7       | 8      | 9        |          |            |       |
|----------------|----|----------|-------|------|---------|--------|----------|----------|------------|-------|
| Day            | I  | J        | K     | L    | M       | N      | O        | P        | Q          | R     |
| <b>Sept 20</b> | 07 | 12 66476 | 4 331 | 4 36 | 1 6855  | 12 746 | d<br>107 | d<br>974 | d<br>13 63 | 11 70 |
| <b>21</b>      | 07 | 13 66476 | 5 331 | 5 36 | 13 6855 | 13 746 | 117      | 1074     | 14 63      | 1 70  |
| <b>22</b>      | 07 | 14 66476 | 6 331 | 6 36 | 14 6855 | 14 746 | 127      | 1174     | 15 63      | 13 70 |
| <b>23</b>      | 07 | 15 66476 | 7 331 | 7 36 | 15 6855 | 15 746 | 137      | 1 74     | 00         | 14 70 |
| <b>24</b>      | 07 | 16 66476 | 8 331 | 0 02 | 16 6855 | 0 63   | 147      | 1374     | 1 00       | 15 70 |
| <b>25</b>      | 7  | 0 97574  | 0 987 | 1 0  | 0 9979  | 1 063  | 157      | 1474     | 0          | 16 7  |
| <b>26</b>      | 07 | 1 97574  | 1 987 | 0    | 1 9979  | 2 63   | 1672     | 1574     | 3 0        | 94    |
| <b>27</b>      | 07 | 2 97574  | 987   | 3 0  | 9979    | 3 063  | 090      | 1674     | 4 0        | 194   |
| <b>28</b>      | 07 | 3 97574  | 3 987 | 4 02 | 3 9979  | 4 63   | 190      | 085      | 5 00       | 294   |
| <b>29</b>      | 07 | 4 97574  | 4 987 | 5 02 | 4 9979  | 5 063  | 90       | 185      | 6 00       | 394   |
| <b>Oct 30</b>  | 07 | 5 97574  | 5 987 | 6 02 | 5 9979  | 6 063  | 390      | 85       | 7 00       | 494   |
| <b>1</b>       | 08 | 6 97574  | 6 987 | 7 0  | 6 9979  | 7 063  | 490      | 385      | 8 00       | 594   |
| <b>2</b>       | 08 | 7 97574  | 7 987 | 8 02 | 7 9979  | 8 63   | 59       | 485      | 9 0        | 694   |
| <b>3</b>       | 08 | 8 97574  | 0 643 | 0 68 | 8 9979  | 9 63   | 690      | 585      | 10 00      | 794   |
| <b>4</b>       | 08 | 9 97574  | 1 643 | 1 68 | 9 9979  | 10 063 | 790      | 685      | 11 00      | 894   |
| <b>5</b>       | 8  | 10 97574 | 643   | 68   | 10 9979 | 11 063 | 890      | 785      | 12 00      | 994   |
| <b>6</b>       | 8  | 11 97574 | 3 643 | 3 68 | 11 9979 | 1 063  | 990      | 885      | 13 0       | 1094  |
| <b>7</b>       | 08 | 12 97574 | 4 643 | 4 68 | 1 9979  | 13 063 | 1090     | 985      | 14 0       | 1194  |
| <b>8</b>       | 08 | 13 97574 | 5 643 | 5 68 | 13 9979 | 14 063 | 1190     | 1085     | 15 00      | 1294  |
| <b>9</b>       | 08 | 14 97574 | 6 643 | 6 68 | 14 9979 | 15 063 | 1290     | 1185     | 16 00      | 1394  |
| <b>10</b>      | 08 | 15 97574 | 7 643 | 7 68 | 15 9979 | 16 063 | 1390     | 1285     | 0 38       | 1494  |
| <b>11</b>      | 08 | 0 8672   | 0 298 | 0 33 | 0 3103  | 0 379  | 149      | 1385     | 1 38       | 1594  |
| <b>12</b>      | 8  | 1 867    | 1 98  | 1 33 | 1 3103  | 1 379  | 1590     | 1485     | 2 38       | 0 19  |
| <b>13</b>      | 08 | 2 2867   | 2 98  | 2 33 | 2 31 3  | 2 379  | 008      | 1585     | 3 38       | 1 19  |
| <b>14</b>      | 08 | 3 867    | 3 98  | 3 33 | 3 31 3  | 3 379  | 108      | 1685     | 4 38       | 19    |
| <b>15</b>      | 08 | 4 8672   | 4 98  | 4 33 | 4 3103  | 4 379  | 208      | 97       | 5 38       | 3 19  |
| <b>16</b>      | 08 | 5 867    | 5 98  | 5 33 | 5 3103  | 5 379  | 308      | 197      | 6 38       | 4 19  |
| <b>17</b>      | 08 | 6 28672  | 6 98  | 6 33 | 6 3103  | 6 379  | 408      | 297      | 7 38       | 5 19  |
| <b>18</b>      | 08 | 7 867    | 7 98  | 7 33 | 7 3103  | 7 379  | 508      | 397      | 8 38       | 6 19  |
| <b>19</b>      | 8  | 8 2867   | 8 98  | 8 33 | 8 3103  | 8 379  | 608      | 497      | 9 38       | 7 19  |
| <b>20</b>      | 08 | 9 867    | 0 954 | 0 99 | 9 3103  | 9 379  | 7 8      | 597      | 10 38      | 8 19  |
| <b>21</b>      | 08 | 10 8672  | 1 954 | 1 99 | 10 3103 | 10 379 | 808      | 697      | 11 38      | 9 19  |
| <b>22</b>      | 08 | 11 867   | 2 954 | 2 99 | 11 3103 | 11 379 | 908      | 797      | 1 38       | 10 19 |
| <b>23</b>      | 08 | 12 867   | 3 954 | 3 99 | 12 31 3 | 1 379  | 1008     | 897      | 13 38      | 11 19 |
| <b>24</b>      | 08 | 13 8672  | 4 954 | 4 99 | 13 31 3 | 13 379 | 1108     | 997      | 14 38      | 1 19  |
| <b>25</b>      | 08 | 14 2867  | 5 954 | 5 99 | 14 3103 | 14 379 | 1208     | 1 97     | 15 38      | 13 19 |
| <b>26</b>      | 08 | 15 867   | 6 954 | 6 99 | 15 31 3 | 15 379 | 1308     | 1197     | 16 38      | 14 19 |
| <b>27</b>      | 08 | 16 867   | 7 954 | 7 99 | 16 3103 | 16 379 | 1408     | 1 97     | 075        | 15 19 |
| <b>28</b>      | 08 | 0 59771  | 0 610 | 0 65 | 0 62 7  | 0 695  | 15 8     | 1397     | 1 75       | 16 19 |
| <b>29</b>      | 08 | 1 59771  | 1 61  | 1 65 | 1 6 7   | 1 695  | 1608     | 1497     | 75         | 0 44  |
| <b>30</b>      | 08 | 2 59771  | 2 610 | 65   | 6227    | 695    | 0 7      | 1597     | 375        | 1 44  |
| <b>31</b>      | 08 | 3 59771  | 3 610 | 3 65 | 3 6 7   | 3 695  | 1 7      | 009      | 475        | 2 44  |
| <b>Nov 1</b>   | 08 | 4 59771  | 4 610 | 4 65 | 4 6 7   | 4 695  | 27       | 109      | 575        | 3 44  |
| <b>2</b>       | 08 | 5 59771  | 5 61  | 5 65 | 5 6 7   | 5 695  | 3 7      | 09       | 675        | 4 44  |
| <b>3</b>       | 08 | 6 59771  | 6 610 | 6 65 | 6 6 27  | 6 695  | 4 7      | 309      | 775        | 5 44  |
| <b>4</b>       | 08 | 7 59771  | 7 610 | 7 65 | 7 6227  | 7 695  | 5 7      | 409      | 875        | 6 44  |
| <b>5</b>       | 8  | 8 59771  | 0 66  | 0 30 | 8 62 7  | 8 695  | 6 7      | 509      | 975        | 7 44  |
| <b>6</b>       | 08 | 9 59771  | 1 66  | 1 30 | 9 6 7   | 9 695  | 7 7      | 609      | 1 75       | 8 44  |
| <b>7</b>       | 09 | 10 59771 | 266   | 2 30 | 1 6 7   | 10 695 | 8 27     | 7 9      | 11 75      | 9 44  |
| <b>8</b>       | 09 | 11 59771 | 3 266 | 3 30 | 11 62 7 | 11 695 | 9 27     | 809      | 12 75      | 10 44 |
| <b>9</b>       | 09 | 12 59771 | 4 266 | 4 30 | 1 6 27  | 1 695  | 10 27    | 909      | 13 75      | 11 44 |
| <b>10</b>      | 09 | 13 59771 | 5 66  | 5 3  | 13 6 7  | 13 695 | 11 7     | 1009     | 14 75      | 1 44  |

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# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

*X continued*      Motions of Mean Longitude and the Arguments for Days

| 1              | 2            | 3            | 4            | 5            | 6            | 7            | 8            | 9            | 10           | 11           |
|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Day            | Mean Long.   | A            | B            | C            | D            | E            | F            | G            | H            | $\alpha$     |
|                | <sup>o</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> | <sup>d</sup> |
| <b>Nov. 11</b> | 314.89953    | 0.35         | 3.74         | 1.919        | 14.501       | 14.57178     | 14.052       | 5.06         | 12.292       | 315.0        |
| <b>12</b>      | 336.47064    | 1.35         | 0.23         | 2.919        | 15.501       | 15.57178     | 15.052       | 6.06         | 13.292       | 316.0        |
| <b>13</b>      | 358.04175    | 0.37         | 1.23         | 3.919        | 16.501       | 16.57178     | 16.052       | 7.06         | 14.292       | 317.0        |
| <b>14</b>      | 19.61286     | 1.37         | 2.23         | 4.919        | 0.807        | 0.88132      | 17.052       | 8.06         | 15.292       | 318.0        |
| <b>15</b>      | 41.18397     | 0.40         | 3.23         | 5.919        | 1.807        | 1.88132      | 18.052       | 0.68         | 16.292       | 319.0        |
| <b>16</b>      | 62.75508     | 1.40         | 4.23         | 6.919        | 2.807        | 2.88132      | 19.052       | 1.68         | 0.475        | 320.0        |
| <b>17</b>      | 84.32619     | 0.42         | 0.71         | 7.919        | 3.807        | 3.88132      | 20.052       | 2.68         | 1.475        | 321.0        |
| <b>18</b>      | 105.89730    | 1.42         | 1.71         | 8.919        | 4.807        | 4.88132      | 21.052       | 3.68         | 2.475        | 322.0        |
| <b>19</b>      | 127.46841    | 0.44         | 2.71         | 9.919        | 5.807        | 5.88132      | 22.052       | 4.68         | 3.475        | 323.0        |
| <b>20</b>      | 149.03952    | 1.44         | 3.71         | 10.919       | 6.807        | 6.88132      | 23.052       | 5.68         | 4.475        | 324.0        |
| <b>21</b>      | 170.61063    | 0.46         | 0.20         | 11.919       | 7.807        | 7.88132      | 24.052       | 6.68         | 5.475        | 325.0        |
| <b>22</b>      | 192.18174    | 1.46         | 1.20         | 0.396        | 8.807        | 8.88132      | 25.052       | 7.68         | 6.475        | 326.0        |
| <b>23</b>      | 213.75285    | 0.48         | 2.20         | 1.396        | 9.807        | 9.88132      | 26.052       | 0.31         | 7.475        | 327.0        |
| <b>24</b>      | 235.32396    | 1.48         | 3.20         | 2.396        | 10.807       | 10.88132     | 27.052       | 1.31         | 8.475        | 328.0        |
| <b>25</b>      | 256.89507    | 0.50         | 4.20         | 3.396        | 11.807       | 11.88132     | 28.052       | 2.31         | 9.475        | 329.0        |
| <b>26</b>      | 278.46618    | 1.50         | 0.69         | 4.396        | 12.807       | 12.88132     | 29.052       | 3.31         | 10.475       | 330.0        |
| <b>27</b>      | 300.03729    | 0.52         | 1.69         | 5.396        | 13.807       | 13.88132     | 30.052       | 4.31         | 11.475       | 331.0        |
| <b>28</b>      | 321.60840    | 1.52         | 2.69         | 6.396        | 14.807       | 14.88132     | 31.052       | 5.31         | 12.475       | 332.0        |
| <b>29</b>      | 343.17951    | 0.54         | 3.69         | 7.396        | 15.807       | 15.88132     | 32.052       | 6.31         | 13.475       | 333.0        |
| <b>30</b>      | 4.75062      | 1.54         | 0.18         | 8.396        | 0.113        | 0.19087      | 33.052       | 7.31         | 14.475       | 334.0        |
| <b>Dec. 1</b>  | 26.32173     | 0.56         | 1.18         | 9.396        | 1.113        | 1.19087      | 34.052       | 8.31         | 15.475       | 335.0        |
| <b>2</b>       | 47.89284     | 1.56         | 2.18         | 10.396       | 2.113        | 2.19087      | 35.052       | 0.93         | 16.475       | 336.0        |
| <b>3</b>       | 69.46395     | 0.59         | 3.18         | 11.396       | 3.113        | 3.19087      | 36.052       | 1.93         | 0.657        | 337.0        |
| <b>4</b>       | 91.03505     | 1.59         | 4.18         | 12.396       | 4.113        | 4.19087      | 37.052       | 2.93         | 1.657        | 338.0        |
| <b>5</b>       | 112.60616    | 0.61         | 0.67         | 0.872        | 5.113        | 5.19087      | 38.052       | 3.93         | 2.657        | 339.0        |
| <b>6</b>       | 134.17727    | 1.61         | 1.67         | 1.872        | 6.113        | 6.19087      | 39.052       | 4.93         | 3.657        | 340.0        |
| <b>7</b>       | 155.74838    | 0.63         | 2.67         | 2.872        | 7.113        | 7.19087      | 40.052       | 5.93         | 4.657        | 341.0        |
| <b>8</b>       | 177.31949    | 1.63         | 3.67         | 3.872        | 8.113        | 8.19087      | 41.052       | 6.93         | 5.657        | 342.0        |
| <b>9</b>       | 198.89060    | 0.65         | 0.16         | 4.872        | 9.113        | 9.19087      | 42.052       | 7.93         | 6.657        | 343.0        |
| <b>10</b>      | 220.46171    | 1.65         | 1.16         | 5.872        | 10.113       | 10.19087     | 43.052       | 0.55         | 7.657        | 344.0        |
| <b>11</b>      | 242.03282    | 0.67         | 2.16         | 6.872        | 11.113       | 11.19087     | 44.052       | 1.55         | 8.657        | 345.0        |
| <b>12</b>      | 263.60393    | 1.67         | 3.16         | 7.872        | 12.113       | 12.19087     | 45.052       | 2.55         | 9.657        | 346.0        |
| <b>13</b>      | 285.17504    | 0.69         | 4.16         | 8.872        | 13.113       | 13.19087     | 46.052       | 3.55         | 10.657       | 347.0        |
| <b>14</b>      | 306.74615    | 1.69         | 0.65         | 9.872        | 14.113       | 14.19087     | 47.052       | 4.55         | 11.657       | 348.0        |
| <b>15</b>      | 328.31726    | 0.71         | 1.65         | 10.872       | 15.113       | 15.19087     | 48.052       | 5.55         | 12.657       | 349.0        |
| <b>16</b>      | 349.88837    | 1.71         | 2.65         | 11.872       | 16.113       | 16.19087     | 49.052       | 6.55         | 13.657       | 350.0        |
| <b>17</b>      | 11.45948     | 0.73         | 3.65         | 0.349        | 0.418        | 0.50041      | 50.052       | 7.55         | 14.657       | 351.0        |
| <b>18</b>      | 33.03059     | 1.73         | 0.14         | 1.349        | 1.418        | 1.50041      | 0.894        | 0.18         | 15.657       | 352.0        |
| <b>19</b>      | 54.60170     | 0.75         | 1.14         | 2.349        | 2.418        | 2.50041      | 1.894        | 1.18         | 16.657       | 353.0        |
| <b>20</b>      | 76.17281     | 1.75         | 2.14         | 3.349        | 3.418        | 3.50041      | 2.894        | 2.18         | 0.840        | 354.0        |
| <b>21</b>      | 97.74392     | 0.78         | 3.14         | 4.349        | 4.418        | 4.50041      | 3.894        | 3.18         | 1.840        | 355.0        |
| <b>22</b>      | 119.31503    | 1.78         | 4.14         | 5.349        | 5.418        | 5.50041      | 4.894        | 4.18         | 2.840        | 356.0        |
| <b>23</b>      | 140.88614    | 0.80         | 0.63         | 6.349        | 6.418        | 6.50041      | 5.894        | 5.18         | 3.840        | 357.0        |
| <b>24</b>      | 162.45725    | 1.80         | 1.63         | 7.349        | 7.418        | 7.50041      | 6.894        | 6.18         | 4.840        | 358.0        |
| <b>25</b>      | 184.02836    | 0.82         | 2.63         | 8.349        | 8.418        | 8.50041      | 7.894        | 7.18         | 5.840        | 359.0        |
| <b>26</b>      | 205.59947    | 1.82         | 3.63         | 9.349        | 9.418        | 9.50041      | 8.894        | 8.18         | 6.840        | 360.0        |
| <b>27</b>      | 227.17058    | 0.84         | 0.11         | 10.349       | 10.418       | 10.50041     | 9.894        | 0.80         | 7.840        | 361.0        |
| <b>28</b>      | 248.74169    | 1.84         | 1.11         | 11.349       | 11.418       | 11.50041     | 10.894       | 1.80         | 8.840        | 362.0        |
| <b>29</b>      | 270.31280    | 0.86         | 2.11         | 12.349       | 12.418       | 12.50041     | 11.894       | 2.80         | 9.840        | 363.0        |
| <b>30</b>      | 291.88391    | 1.86         | 3.11         | 0.826        | 13.418       | 13.50041     | 12.894       | 3.80         | 10.840       | 364.0        |
| <b>31</b>      | 313.45501    | 0.88         | 4.11         | 1.826        | 14.418       | 14.50041     | 13.894       | 4.80         | 11.840       | 365.0        |
| <b>32</b>      | 335.02612    | 1.88         | 0.60         | 2.826        | 15.418       | 15.50041     | 14.894       | 5.80         | 12.840       | 366.0        |

In Leap Year diminish the date in Columns 1, 12, by 1 day after Feb. 28.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

X continued

Motions of Mean Longitude and the Arguments for Days

|               | 3  | 4        | 5     | 6    | 7      | 8      | 9     |       |       |       |
|---------------|----|----------|-------|------|--------|--------|-------|-------|-------|-------|
| D y           | I  | J        | K     | L    | M      | N      | O     | P     | Q     | R     |
|               |    |          | a     |      |        |        | a     |       | a     |       |
| <b>Nov</b> 11 | 9  | 14 59771 | 6 66  | 6 30 | 14 6 7 | 14 695 | 12 27 | 11 09 | 15 75 | 13 44 |
| 12            | 09 | 15 59771 | 7 66  | 7 30 | 15 6 7 | 15 695 | 13 7  | 1 9   | 13    | 14 44 |
| 13            | 9  | 16 59771 | 8 266 | 8 30 | 16 6 7 | 01     | 14 7  | 13 9  | 1 13  | 15 44 |
| 14            | 9  | 090869   | 09    | 096  | 935    | 1 1    | 15 7  | 14 9  | 2 13  | 16 44 |
| 15            | 09 | 19 869   | 19    | 196  | 19350  | 01     | 16 7  | 15 09 | 3 13  | 0 68  |
| 16            | 09 | 290869   | 29 2  | 96   | 9350   | 3 01   | 0 45  | 16 09 | 4 13  | 1 68  |
| 17            | 9  | 390869   | 39    | 396  | 39350  | 4 1    | 1 45  | 0 0   | 5 13  | 2 68  |
| 18            | 09 | 49 869   | 49    | 496  | 49350  | 5 012  | 45    | 1 0   | 6 13  | 3 68  |
| 19            | 09 | 590869   | 59    | 596  | 59350  | 6 012  | 3 45  | 0     | 7 13  | 4 68  |
| 20            | 09 | 690869   | 69 2  | 696  | 69350  | 7 1    | 4 45  | 3 0   | 8 13  | 5 68  |
| 21            | 09 | 79 869   | 792   | 796  | 79350  | 8 01   | 5 45  | 4 0   | 9 13  | 6 68  |
| 22            | 09 | 890869   | 0578  | 06   | 8935   | 9 01   | 6 45  | 5 20  | 10 13 | 7 68  |
| 23            | 09 | 99 869   | 1578  | 16   | 99350  | 10 01  | 7 45  | 6 20  | 11 13 | 8 68  |
| 24            | 09 | 190869   | 578   | 62   | 109350 | 11 01  | 8 45  | 7 20  | 1 13  | 9 68  |
| 25            | 09 | 1190869  | 3578  | 36   | 11935  | 1 012  | 9 45  | 8 0   | 13 13 | 10 68 |
| 26            | 09 | 190869   | 4578  | 462  | 19350  | 13 012 | 10 45 | 9 20  | 14 13 | 11 68 |
| 27            | 09 | 139 869  | 5578  | 562  | 139350 | 14 01  | 11 45 | 10 20 | 15 13 | 12 68 |
| 28            | 09 | 1490869  | 6578  | 662  | 149350 | 15 012 | 12 45 | 11 20 | 16 13 | 13 68 |
| 29            | 09 | 159 869  | 7578  | 762  | 159350 | 16 01  | 13 45 | 12 0  | 0 50  | 14 68 |
| 30            | 09 | 0 1968   | 0234  | 027  | 0 474  | 0 328  | 14 45 | 13 20 | 1 50  | 15 68 |
| <b>Dec</b> 1  | 09 | 121968   | 134   | 127  | 12474  | 138    | 15 45 | 14 0  | 2 50  | 16 68 |
| 2             | 09 | 1968     | 234   | 227  | 22474  | 2328   | 16 45 | 15 20 | 3 50  | 0 93  |
| 3             | 09 | 321968   | 3234  | 37   | 32474  | 338    | 0 63  | 16 20 | 4 50  | 1 93  |
| 4             | 09 | 421968   | 4234  | 427  | 4474   | 4328   | 1 63  | 0 32  | 5 50  | 93    |
| 5             | 09 | 51968    | 534   | 527  | 52474  | 5328   | 63    | 132   | 6 50  | 393   |
| 6             | 09 | 621968   | 6234  | 627  | 62474  | 6328   | 363   | 3     | 7 50  | 493   |
| 7             | 09 | 721968   | 7234  | 727  | 7474   | 7328   | 463   | 332   | 8 50  | 593   |
| 8             | 09 | 821968   | 834   | 827  | 8474   | 838    | 563   | 43    | 9 50  | 693   |
| 9             | 9  | 91968    | 0889  | 093  | 92474  | 9328   | 663   | 532   | 10 5  | 793   |
| 10            | 09 | 101968   | 1889  | 193  | 102474 | 1038   | 763   | 632   | 11 50 | 893   |
| 11            | 9  | 1121968  | 889   | 293  | 11474  | 11328  | 863   | 732   | 12 50 | 993   |
| 12            | 09 | 11968    | 3889  | 393  | 1474   | 1238   | 963   | 83    | 13 50 | 1093  |
| 13            | 1  | 1321968  | 4889  | 493  | 13474  | 13328  | 1063  | 932   | 14 50 | 1193  |
| 14            | 10 | 1421968  | 5889  | 593  | 142474 | 14328  | 1163  | 1032  | 15 50 | 1293  |
| 15            | 10 | 151968   | 6889  | 693  | 152474 | 15328  | 1263  | 113   | 16 50 | 1393  |
| 16            | 10 | 1621968  | 7889  | 793  | 16474  | 16328  | 1363  | 13    | 0 88  | 1493  |
| 17            | 1  | 05366    | 0545  | 059  | 05598  | 0645   | 1463  | 1332  | 1 88  | 1593  |
| 18            | 1  | 153066   | 1545  | 159  | 15598  | 1645   | 1563  | 143   | 2 88  | 0 18  |
| 19            | 10 | 253066   | 545   | 259  | 5598   | 645    | 1663  | 1532  | 3 88  | 1 18  |
| 20            | 10 | 353066   | 3545  | 359  | 35598  | 3645   | 0 81  | 163   | 4 88  | 2 18  |
| 21            | 1  | 453066   | 4545  | 459  | 45598  | 4645   | 181   | 0 43  | 5 88  | 3 18  |
| 22            | 10 | 55366    | 5545  | 559  | 55598  | 5645   | 281   | 1 43  | 6 88  | 4 18  |
| 23            | 0  | 653066   | 6545  | 659  | 65598  | 6645   | 381   | 43    | 7 88  | 5 18  |
| 24            | 10 | 753066   | 7545  | 759  | 75598  | 7645   | 481   | 3 43  | 8 88  | 6 18  |
| 25            | 10 | 853066   | 0 1   | 0 4  | 85598  | 8645   | 581   | 4 43  | 9 88  | 7 18  |
| 26            | 10 | 953066   | 1 1   | 1 24 | 95598  | 9645   | 681   | 5 43  | 10 88 | 8 18  |
| 27            | 10 | 105366   | 2 01  | 4    | 105598 | 1 645  | 781   | 6 43  | 11 88 | 9 18  |
| 28            | 1  | 115366   | 3 01  | 3 4  | 115598 | 11645  | 881   | 7 43  | 1 88  | 10 18 |
| 29            | 1  | 15366    | 4 1   | 4 4  | 15598  | 1 645  | 981   | 8 43  | 13 88 | 11 18 |
| 30            | 10 | 1353066  | 5 01  | 5 4  | 135598 | 13645  | 1081  | 9 43  | 14 88 | 12 18 |
| 31            | 10 | 145366   | 6 2 1 | 6 24 | 145598 | 14645  | 1181  | 10 43 | 15 88 | 13 18 |
| 32            | 10 | 155366   | 7 01  | 7 24 | 155598 | 15645  | 1 81  | 11 43 | 0 5   | 14 18 |

I L p Y d i m i h t h d t i C l m by d y f t F b 8

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

**XI**                      Motion of Mean Longitude for Fractions of a Day

| 1    | 2          | 1    | 2          | 1      | 2          | 1      | 2          |
|------|------------|------|------------|--------|------------|--------|------------|
| Day  | Mean Long. | Day  | Mean Long. | Day    | Mean Long. | Day    | Mean Long. |
| d    | o          | d    | o          | d      | o          | d      | o          |
| 0.01 | 0.21571    | 0.51 | 11.00127   | 0.0001 | 0.00216    | 0.0051 | 0.11001    |
| 0.02 | 0.43142    | 0.52 | 11.21698   | 2      | 431        | 52     | 11.217     |
| 0.03 | 0.64713    | 0.53 | 11.43269   | 3      | 647        | 53     | 11.433     |
| 0.04 | 0.86284    | 0.54 | 11.64840   | 4      | 863        | 54     | 11.648     |
| 0.05 | 1.07856    | 0.55 | 11.86411   | 5      | 1079       | 55     | 11.864     |
| 0.06 | 1.29427    | 0.56 | 12.07982   | 0.0006 | 0.01294    | 0.0056 | 0.12080    |
| 0.07 | 1.50998    | 0.57 | 12.29553   | 7      | 1510       | 57     | 12.296     |
| 0.08 | 1.72569    | 0.58 | 12.51124   | 8      | 1726       | 58     | 12.511     |
| 0.09 | 1.94140    | 0.59 | 12.72695   | 9      | 1941       | 59     | 12.727     |
| 0.10 | 2.15711    | 0.60 | 12.94267   | 10     | 2157       | 60     | 12.943     |
| 0.11 | 2.37282    | 0.61 | 13.15838   | 0.0011 | 0.02373    | 0.0061 | 0.13158    |
| 0.12 | 2.58853    | 0.62 | 13.37409   | 12     | 2589       | 62     | 13.374     |
| 0.13 | 2.80424    | 0.63 | 13.58980   | 13     | 2804       | 63     | 13.590     |
| 0.14 | 3.01996    | 0.64 | 13.80551   | 14     | 3020       | 64     | 13.806     |
| 0.15 | 3.23567    | 0.65 | 14.02122   | 15     | 3236       | 65     | 14.021     |
| 0.16 | 3.45138    | 0.66 | 14.23693   | 0.0016 | 0.03451    | 0.0066 | 0.14237    |
| 0.17 | 3.66709    | 0.67 | 14.45264   | 17     | 3667       | 67     | 14.453     |
| 0.18 | 3.88280    | 0.68 | 14.66835   | 18     | 3883       | 68     | 14.668     |
| 0.19 | 4.09851    | 0.69 | 14.88407   | 19     | 4099       | 69     | 14.884     |
| 0.20 | 4.31422    | 0.70 | 15.09978   | 20     | 4314       | 70     | 15.100     |
| 0.21 | 4.52993    | 0.71 | 15.31549   | 0.0021 | 0.04530    | 0.0071 | 0.15315    |
| 0.22 | 4.74564    | 0.72 | 15.53120   | 22     | 4746       | 72     | 15.531     |
| 0.23 | 4.96136    | 0.73 | 15.74691   | 23     | 4961       | 73     | 15.747     |
| 0.24 | 5.17707    | 0.74 | 15.96262   | 24     | 5177       | 74     | 15.963     |
| 0.25 | 5.39278    | 0.75 | 16.17833   | 25     | 5393       | 75     | 16.178     |
| 0.26 | 5.60849    | 0.76 | 16.39404   | 0.0026 | 0.05608    | 0.0076 | 0.16394    |
| 0.27 | 5.82420    | 0.77 | 16.60975   | 27     | 5824       | 77     | 16.610     |
| 0.28 | 6.03991    | 0.78 | 16.82547   | 28     | 6040       | 78     | 16.825     |
| 0.29 | 6.25562    | 0.79 | 17.04118   | 29     | 6256       | 79     | 17.041     |
| 0.30 | 6.47133    | 0.80 | 17.25689   | 30     | 6471       | 80     | 17.257     |
| 0.31 | 6.68704    | 0.81 | 17.47260   | 0.0031 | 0.06687    | 0.0081 | 0.17473    |
| 0.32 | 6.90276    | 0.82 | 17.68831   | 32     | 6903       | 82     | 17.688     |
| 0.33 | 7.11847    | 0.83 | 17.90402   | 33     | 7118       | 83     | 17.904     |
| 0.34 | 7.33418    | 0.84 | 18.11973   | 34     | 7334       | 84     | 18.120     |
| 0.35 | 7.54989    | 0.85 | 18.33544   | 35     | 7550       | 85     | 18.336     |
| 0.36 | 7.76560    | 0.86 | 18.55115   | 0.0036 | 0.07766    | 0.0086 | 0.18551    |
| 0.37 | 7.98131    | 0.87 | 18.76687   | 37     | 7981       | 87     | 18.767     |
| 0.38 | 8.19702    | 0.88 | 18.98258   | 38     | 8197       | 88     | 18.983     |
| 0.39 | 8.41273    | 0.89 | 19.19829   | 39     | 8413       | 89     | 19.198     |
| 0.40 | 8.62844    | 0.90 | 19.41400   | 40     | 8628       | 90     | 19.414     |
| 0.41 | 8.84415    | 0.91 | 19.62971   | 0.0041 | 0.08844    | 0.0091 | 0.19630    |
| 0.42 | 9.05987    | 0.92 | 19.84542   | 42     | 9060       | 92     | 19.845     |
| 0.43 | 9.27558    | 0.93 | 20.06113   | 43     | 9276       | 93     | 20.061     |
| 0.44 | 9.49129    | 0.94 | 20.27684   | 44     | 9491       | 94     | 20.277     |
| 0.45 | 9.70700    | 0.95 | 20.49255   | 45     | 9707       | 95     | 20.493     |
| 0.46 | 9.92271    | 0.96 | 20.70827   | 0.0046 | 0.09923    | 0.0096 | 0.20708    |
| 0.47 | 10.13842   | 0.97 | 20.92398   | 47     | 10138      | 97     | 20.924     |
| 0.48 | 10.35413   | 0.98 | 21.13969   | 48     | 10354      | 98     | 21.140     |
| 0.49 | 10.56984   | 0.99 | 21.35540   | 49     | 10570      | 99     | 21.355     |
| 0.50 | 10.78555   | 1.00 | 21.57111   | 0.0050 | 0.10786    | 0.0100 | 0.21571    |

For Arguments A—E, the fraction of a day must be added as a correction to the entries of columns 3-22 of Table X.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

**XII**

**XIII**

**XIV**

| A   | Equation | $\Delta$ |
|-----|----------|----------|
| 000 | 000100   | +20      |
| 04  | 107      | 20       |
| 08  | 115      | 19       |
| 12  | 12       | 16       |
| 16  | 18       | 15       |
| 20  | 134      | 15       |
| 024 | 0140     | +14      |
| 28  | 145      | 11       |
| 32  | 149      | 10       |
| 36  | 153      | 08       |
| 40  | 155      | 5        |
| 044 | 00157    | +04      |
| 48  | 158      | +01      |
| 52  | 158      | -01      |
| 56  | 157      | 04       |
| 60  | 155      | 6        |
| 064 | 000152   | -09      |
| 68  | 148      | 10       |
| 72  | 144      | 11       |
| 76  | 139      | 14       |
| 80  | 133      | 15       |
| 084 | 00017    | -16      |
| 88  | 10       | 18       |
| 92  | 113      | 19       |
| 96  | 105      | 19       |
| 100 | 98       | 18       |
| 104 | 000091   | -18      |
| 08  | 84       | 18       |
| 12  | 77       | 18       |
| 16  | 70       | 16       |
| 20  | 64       | 14       |
| 124 | 000059   | -13      |
| 28  | 54       | 11       |
| 32  | 50       | 09       |
| 36  | 47       | 08       |
| 40  | 44       | 05       |
| 144 | 00043    | -03      |
| 48  | 42       | -01      |
| 52  | 4        | +03      |
| 56  | 44       | 05       |
| 60  | 46       | 6        |
| 164 | 000049   | +09      |
| 68  | 53       | 11       |
| 72  | 58       | 13       |
| 76  | 63       | 14       |
| 80  | 69       | 15       |
| 184 | 000075   | +16      |
| 88  | 8        | 18       |
| 92  | 89       | 19       |
| 96  | 97       | 19       |
| 200 | 00104    | +19      |

| B  | Equation | $\Delta$ |
|----|----------|----------|
| 00 | 0010     | +7       |
| 1  | 17       | 7        |
| 2  | 114      | 7        |
| 3  | 121      | 7        |
| 4  | 17       | 6        |
| 5  | 133      | 6        |
| 06 | 000138   | +5       |
| 7  | 142      | 4        |
| 8  | 146      | 3        |
| 9  | 148      | 2        |
| 10 | 150      |          |
| 11 | 000151   | +1       |
| 2  | 151      | -1       |
| 3  | 15       |          |
| 4  | 147      | 3        |
| 5  | 144      | 4        |
| 16 | 00014    | -5       |
| 7  | 135      | 5        |
| 8  | 130      | 6        |
| 9  | 124      | 6        |
| 20 | 118      | 7        |
| 21 | 000111   | -7       |
| 2  | 104      | 7        |
| 3  | 97       | 7        |
| 4  | 90       | 7        |
| 5  | 83       | 7        |
| 26 | 00076    | -7       |
| 7  | 70       | 6        |
| 8  | 65       | 5        |
| 9  | 60       | 5        |
| 30 | 56       | 4        |
| 31 | 000053   | -3       |
| 2  | 50       | 2        |
| 3  | 49       | -1       |
| 4  | 49       | +1       |
| 5  | 5        |          |
| 36 | 000051   | +        |
| 7  | 54       | 3        |
| 8  | 57       | 4        |
| 9  | 62       | 5        |
| 40 | 67       | 5        |
| 41 | 00072    | +6       |
| 2  | 78       | 7        |
| 3  | 85       | 7        |
| 4  | 92       | 7        |
| 5  | 99       | 7        |
| 46 | 0016     | +7       |
| 7  | 113      | 7        |
| 8  | 120      | 7        |
| 9  | 16       | 6        |
| 50 | 0013     | +6       |

| C   | Equation | $\Delta$ |
|-----|----------|----------|
| 00  | 00030    | -28      |
| 1   | 72       | 8        |
| 2   | 44       | 28       |
| 3   | 17       | 7        |
| 4   | 190      | 26       |
| 5   | 165      | 25       |
| 06  | 000141   | -24      |
| 7   | 118      |          |
| 8   | 97       | 0        |
| 9   | 79       | 18       |
| 10  | 6        | 16       |
| 11  | 00047    | -14      |
| 2   | 34       | 12       |
| 3   | 3        | 0        |
| 4   | 15       | 7        |
| 5   | 9        | 6        |
| 16  | 00004    | -4       |
| 7   |          | -2       |
| 8   | 1        | 0        |
| 9   | 2        | +        |
| 20  | 5        | 4        |
| 21  | 000009   | +5       |
| 2   | 14       | 6        |
| 3   |          | 7        |
| 4   | 8        | 8        |
| 5   | 36       | 8        |
| 26  | 000044   | +9       |
| 7   | 53       | 10       |
| 8   | 63       | 10       |
| 9   | 73       | 10       |
| 30  | 83       | 10       |
| 31  | 00093    | +10      |
| 2   | 103      | 10       |
| 3   | 113      | 10       |
| 4   | 13       | 10       |
| 5   | 133      | 10       |
| 36  | 000143   | +10      |
| 7   | 153      | 1        |
| 8   | 16       | 9        |
| 9   | 171      | 9        |
| 40  | 18       | 9        |
| 41  | 000189   | +9       |
| 2   | 197      | 8        |
| 3   | 205      | 8        |
| 4   | 213      | 8        |
| 5   | 21       | 8        |
| 46  | 000228   | +7       |
| 7   | 35       | 7        |
| 8   | 242      | 7        |
| 9   | 249      | 7        |
| 50  | 00255    | +6       |
| 50  | 00055    | +6       |
| 1   | 60       | 5        |
| 2   | 265      | 5        |
| 3   | 70       | 5        |
| 4   | 74       | 4        |
| 5   | 278      | 4        |
| 56  | 000282   | +4       |
| 7   | 85       | 3        |
| 8   | 88       | 3        |
| 9   | 91       | 3        |
| 60  | 294      | 3        |
| 61  | 000296   | +2       |
| 2   | 98       | 3        |
| 3   | 31       | 3        |
| 4   | 303      | 3        |
| 5   | 306      | 3        |
| 66  | 000308   | +        |
| 7   | 311      | 3        |
| 8   | 314      | 3        |
| 9   | 317      | 4        |
| 70  | 321      | 4        |
| 71  | 000325   | +4       |
| 2   | 329      | 5        |
| 3   | 334      | 5        |
| 4   | 339      | 5        |
| 5   | 344      | 6        |
| 76  | 000350   | +6       |
| 7   | 356      | 7        |
| 8   | 363      | 7        |
| 9   | 370      | 7        |
| 80  | 377      | 8        |
| 81  | 000385   | +8       |
| 2   | 393      | 8        |
| 3   | 401      | 8        |
| 4   | 409      | 9        |
| 5   | 418      | 9        |
| 86  | 0047     | +9       |
| 7   | 436      | 9        |
| 8   | 445      | 10       |
| 9   | 455      | 10       |
| 90  | 464      | 1        |
| 91  | 000474   | +10      |
| 2   | 484      | 11       |
| 3   | 495      | 11       |
| 4   | 55       | 10       |
| 5   | 515      | 10       |
| 96  | 0525     | +10      |
| 7   | 535      | 1        |
| 8   | 545      | 10       |
| 9   | 554      | 9        |
| 100 | 00563    | +9       |
| 100 | 000563   | +9       |
| 1   | 571      | 8        |
| 2   | 578      | 7        |
| 3   | 585      | 6        |
| 4   | 590      | 5        |
| 5   | 594      | 4        |
| 106 | 000597   | +3       |
| 7   | 599      | +1       |
| 8   | 599      | -1       |
| 9   | 597      | 3        |
| 110 | 593      | 5        |
| 111 | 000587   | -7       |
| 2   | 579      | 9        |
| 3   | 569      | 12       |
| 4   | 556      | 14       |
| 5   | 542      | 15       |
| 116 | 000526   | -18      |
| 7   | 507      | 0        |
| 8   | 487      | 21       |
| 9   | 465      | 23       |
| 120 | 441      | 25       |
| 121 | 000416   | -26      |
| 2   | 390      | 7        |
| 3   | 363      | 28       |
| 4   | 335      | 28       |
| 5   | 307      | 9        |
| 126 | 000278   | -9       |
| 7   | 50       | 28       |
| 8   | 23       | 27       |
| 9   | 196      | 6        |
| 130 | 171      | 25       |
| 131 | 000146   | -24      |
| 2   | 13       | 2        |
| 3   | 102      | 0        |
| 4   | 83       | 19       |
| 5   | 65       | 17       |
| 136 | 000050   | -14      |
| 7   | 37       | 1        |
| 8   | 26       | 10       |
| 9   | 17       | 8        |
| 140 | 10       | 6        |
| 141 | 00005    | -4       |
| 2   |          | 2        |
| 3   | 1        | -1       |
| 4   | 1        | +2       |
| 5   | 4        | 4        |
| 146 | 000008   | +5       |
| 7   | 13       | 6        |
| 8   | 19       | 7        |
| 9   | 26       | 7        |
| 150 | 000033   | +7       |

C t t + 00

C t t + 00

Appl d C t t + 00300



# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XV

Equation of Longitude

Argument D

| 1   | 2        | 3        | 1    | 2        | 3        | 1    | 2        | 3        | 1    | 2        | 3        |
|-----|----------|----------|------|----------|----------|------|----------|----------|------|----------|----------|
| D   | Equation | $\Delta$ | D    | Equation | $\Delta$ | D    | Equation | $\Delta$ | D    | Equation | $\Delta$ |
| 0.0 | 0.02200  | - 78     | 5.0  | 0.00221  | + 24     | 10.0 | 0.03411  | + 64     | 15.0 | 0.03438  | - 63     |
| .1  | 2122     | 78       | .1   | 246      | 27       | .1   | 3474     | 62       | .1   | 3374     | 65       |
| .2  | 2044     | 78       | .2   | 274      | 30       | .2   | 3535     | 60       | .2   | 3309     | 66       |
| .3  | 1966     | 78       | .3   | 305      | 33       | .3   | 3594     | 58       | .3   | 3242     | 68       |
| .4  | 1888     | 77       | .4   | 339      | 35       | .4   | 3651     | 56       | .4   | 3173     | 70       |
| .5  | 1811     | 76       | .5   | 375      | 37       | .5   | 3706     | 54       | .5   | 3103     | 71       |
| 0.6 | 0.01735  | - 76     | 5.6  | 0.00413  | + 40     | 10.6 | 0.03759  | + 52     | 15.6 | 0.03032  | - 72     |
| .7  | 1659     | 76       | .7   | 455      | 43       | .7   | 3810     | 50       | .7   | 2960     | 73       |
| .8  | 1584     | 75       | .8   | 498      | 45       | .8   | 3858     | 47       | .8   | 2887     | 74       |
| .9  | 1509     | 74       | .9   | 545      | 48       | .9   | 3904     | 45       | .9   | 2812     | 75       |
| 1.0 | 1436     | 73       | 6.0  | 593      | 50       | 11.0 | 3948     | 43       | 16.0 | 2737     | 76       |
| 1.1 | 0.01364  | - 72     | 6.1  | 0.00644  | + 52     | 11.1 | 0.03989  | + 40     | 16.1 | 0.02661  | - 76     |
| .2  | 1293     | 71       | .2   | 697      | 54       | .2   | 4027     | 37       | .2   | 2585     | 77       |
| .3  | 1223     | 69       | .3   | 752      | 56       | .3   | 4063     | 35       | .3   | 2507     | 78       |
| .4  | 1155     | 68       | .4   | 809      | 58       | .4   | 4097     | 33       | .4   | 2430     | 77       |
| .5  | 1088     | 67       | .5   | 868      | 60       | .5   | 4128     | 30       | .5   | 2352     | 78       |
| 1.6 | 0.01022  | - 65     | 6.6  | 0.00929  | + 62     | 11.6 | 0.04156  | + 27     | 16.6 | 0.02274  | - 78     |
| .7  | 959      | 63       | .7   | 992      | 64       | .7   | 4181     | 24       | .7   | 2196     | 79       |
| .8  | 897      | 61       | .8   | 1057     | 66       | .8   | 4203     | 21       | .8   | 2117     | 78       |
| .9  | 837      | 59       | .9   | 1123     | 67       | .9   | 4223     | 18       | .9   | 2039     | 78       |
| 2.0 | 779      | 57       | 7.0  | 1191     | 69       | 12.0 | 4239     | 15       | 17.0 | 1962     | 77       |
| 2.1 | 0.00723  | - 55     | 7.1  | 0.01260  | + 70     | 12.1 | 0.04253  | + 13     | 17.1 | 0.01884  | - 78     |
| .2  | 669      | 53       | .2   | 1330     | 71       | .2   | 4264     | 10       | .2   | 1807     | 77       |
| .3  | 617      | 51       | .3   | 1402     | 72       | .3   | 4272     | 7        | .3   | 1730     | 77       |
| .4  | 567      | 49       | .4   | 1475     | 73       | .4   | 4277     | 4        | .4   | 1654     | 76       |
| .5  | 520      | 46       | .5   | 1548     | 74       | .5   | 4279     | + 1      | .5   | 1579     | 75       |
| 2.6 | 0.00475  | - 44     | 7.6  | 0.01623  | + 75     | 12.6 | 0.04278  | - 2      | 17.6 | 0.01505  | - 74     |
| .7  | 433      | 41       | .7   | 1699     | 76       | .7   | 4274     | 5        | .7   | 1432     | 73       |
| .8  | 393      | 39       | .8   | 1775     | 77       | .8   | 4268     | 8        | .8   | 1360     | 72       |
| .9  | 355      | 36       | .9   | 1852     | 77       | .9   | 4258     | 11       | .9   | 1289     | 71       |
| 3.0 | 321      | 33       | 8.0  | 1929     | 78       | 13.0 | 4245     | 14       | 18.0 | 1219     | 69       |
| 3.1 | 0.00289  | - 31     | 8.1  | 0.02007  | + 78     | 13.1 | 0.04230  | - 17     | 18.1 | 0.01151  | - 68     |
| .2  | 259      | 28       | .2   | 2085     | 78       | .2   | 4211     | 20       | .2   | 1084     | 66       |
| .3  | 233      | 25       | .3   | 2163     | 78       | .3   | 4190     | 23       | .3   | 1019     | 65       |
| .4  | 209      | 23       | .4   | 2241     | 79       | .4   | 4166     | 26       | .4   | 955      | 63       |
| .5  | 187      | 20       | .5   | 2320     | 78       | .5   | 4139     | 28       | .5   | 893      | 61       |
| 3.6 | 0.00169  | - 18     | 8.6  | 0.02398  | + 78     | 13.6 | 0.04110  | - 31     | 18.6 | 0.00833  | - 59     |
| .7  | 154      | 14       | .7   | 2475     | 77       | .7   | 4078     | 34       | .7   | 775      | 57       |
| .8  | 142      | 11       | .8   | 2553     | 78       | .8   | 4043     | 37       | .8   | 720      | 55       |
| .9  | 132      | 9        | .9   | 2630     | 77       | .9   | 4005     | 39       | .9   | 666      | 53       |
| 4.0 | 125      | 5        | 9.0  | 2706     | 76       | 14.0 | 3965     | 42       | 19.0 | 614      | 51       |
| 4.1 | 0.00122  | - 2      | 9.1  | 0.02781  | + 75     | 14.1 | 0.03922  | - 44     | 19.1 | 0.00564  | - 49     |
| .2  | 121      | + 1      | .2   | 2856     | 75       | .2   | 3878     | 46       | .2   | 517      | 46       |
| .3  | 123      | 4        | .3   | 2930     | 74       | .3   | 3830     | 49       | .3   | 473      | 44       |
| .4  | 129      | 7        | .4   | 3002     | 73       | .4   | 3780     | 51       | .4   | 430      | 42       |
| .5  | 137      | 10       | .5   | 3074     | 71       | .5   | 3728     | 53       | .5   | 390      | 39       |
| 4.6 | 0.00148  | + 13     | 9.6  | 0.03144  | + 70     | 14.6 | 0.03674  | - 55     | 19.6 | 0.00353  | - 36     |
| .7  | 162      | 15       | .7   | 3213     | 69       | .7   | 3618     | 57       | .7   | 319      | 33       |
| .8  | 178      | 18       | .8   | 3281     | 67       | .8   | 3560     | 59       | .8   | 287      | 31       |
| .9  | 198      | 22       | .9   | 3347     | 65       | .9   | 3500     | 61       | .9   | 257      | 28       |
| 5.0 | 0.00221  | + 24     | 10.0 | 0.03411  | + 64     | 15.0 | 0.03438  | - 63     | 20.0 | 0.00231  | - 25     |

Applied Constant : +0°02200.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XVI

Equation of Longitude

Argument E

| E                    | Equa<br>tion | 3<br>o or | 4<br>$\frac{1}{2} \Delta^2$ | E    | Equa<br>tion | 3<br>o or | 4<br>$\frac{1}{2} \Delta^2$ | E    | Equa<br>tion | 3<br>o or | 4<br>$\frac{1}{2} \Delta^2$ | E     | Equa<br>tion | 3<br>o or | 4<br>$\frac{1}{2} \Delta^2$ |
|----------------------|--------------|-----------|-----------------------------|------|--------------|-----------|-----------------------------|------|--------------|-----------|-----------------------------|-------|--------------|-----------|-----------------------------|
| <sup>a</sup><br>0 00 | 0 88000      | +321 0    | 0                           | 2 50 | 1 56655      | +186 4    | -0 5                        | 5 00 | 68198        | -99 9     | -0 6                        | 7 50  | 1 14 03      | -299 7    | -0                          |
| 05                   | 896 5        | 3 09      | 0                           | 55   | 1 57575      | 181 5     | 0 5                         | 05   | 1 67685      | 105 5     | 0 6                         | 55    | 1 1700       | 301 5     | 0 2                         |
| 10                   | 91 09        | 32 7      |                             | 60   | 1 5847       | 176 4     | 0 5                         | 10   | 1 67143      | 111 1     | 0 5                         | 60    | 1 11188      | 3 3       | 0                           |
| 15                   | 9281         | 3 4       | 0 0                         | 65   | 1 59339      | 171       | 0 5                         | 15   | 1 66574      | 116 5     | 0 5                         | 65    | 09668        | 304 7     | 1                           |
| 20                   | 94413        | 3 0       |                             | 70   | 1 6 18       | 166 1     | 0 5                         | 20   | 1 65978      | 121 9     | 0 5                         | 70    | 1 08141      | 306 1     | 0 1                         |
| 25                   | 96 1         | 319 5     | -0 1                        | 75   | 1 61 0       | 161 0     | 0 5                         | 25   | 1 65355      | 1 74      | 0 5                         | 75    | 1 066 7      | 307 6     | 0 1                         |
| 0 30                 | 97608        | +318 9    | - 1                         | 2 80 | 1 6179       | +155 7    | 0 5                         | 5 30 | 1 64704      | -132 9    | -0 5                        | 7 80  | 1 5065       | -308 9    | -0 1                        |
| 35                   | 99 1         | 318 1     | 0 1                         | 85   | 1 6 557      | 150 3     | 0 5                         | 35   | 1 640 6      | 138 3     | 0 5                         | 85    | 1 03518      | 309 8     | 1                           |
| 40                   | 1 0 789      | 317 2     | 1                           | 90   | 1 63 95      | 145 0     | 0 5                         | 40   | 1 63321      | 143 6     | 0 5                         | 90    | 1 01967      | 310 7     | 0 1                         |
| 45                   | 1 373        | 316 3     | 1                           | 95   | 1 64007      | 139 8     | 0 6                         | 45   | 1 6 590      | 148 7     | 0 5                         | 95    | 1 00411      | 311 7     | 1                           |
| 50                   | 1 0395       | 315 3     | -0 1                        | 3 00 | 1 64693      | 134 2     | 0 6                         | 50   | 1 61834      | 154 0     | 0 5                         | 8 00  | 0 98850      | 312 6     | 0 1                         |
| 0 55                 | 1 5526       | +314 0    | -0                          | 3 05 | 1 65349      | +1 84     | -0 6                        | 5 55 | 1 61 50      | -159      | 0 5                         | 8 05  | 0 97 85      | -313      | -0 1                        |
| 60                   | 1 07 9       | 31 5      | 0                           | 10   | 1 65977      | 1 3       | 0 6                         | 60   | 1 60 42      | 164       | 0 5                         | 10    | 95718        | 313 8     | -0 1                        |
| 65                   | 1 08651      | 311 0     | 0                           | 15   | 1 66579      | 117 5     | 0 6                         | 65   | 1 59410      | 169 1     | 0 5                         | 15    | 94147        | 314 4     | 0 0                         |
| 70                   | 1 10 0       | 309 5     | 0                           | 20   | 1 6715       | 111 6     | 0 6                         | 70   | 1 58551      | 174       | 5                           | 20    | 9 574        | 314 8     | 0 0                         |
| 75                   | 1 746        | 307 9     |                             | 25   | 1 67695      | 106 0     | 0 6                         | 75   | 1 57668      | 179       | 0 5                         | 25    | 90999        | 315 0     | 0 0                         |
| 0 80                 | 1 13281      | +306 0    | -                           | 3 30 | 1 68 1       | +100 4    | -0 6                        | 5 80 | 1 56759      | -184 0    | -0 5                        | 8 30  | 0 894 4      | -315 1    | 0 0                         |
| 85                   | 1 148 6      | 304       | 0                           | 35   | 1 68699      | 94 5      | 0 6                         | 85   | 1 55828      | 188 5     | 0 5                         | 35    | 87848        | 315 1     | 0 0                         |
| 90                   | 1 16323      | 30 3      | 0 2                         | 40   | 1 69157      | 88 7      | 0 6                         | 90   | 1 54874      | 193 3     | 0 5                         | 40    | 86273        | 315 1     | 0                           |
| 95                   | 1 178 9      | 300       | 0 2                         | 45   | 1 69586      | 83 0      | 0 6                         | 95   | 1 53895      | 198 1     | 0 5                         | 45    | 84699        | 314 8     | 0 0                         |
| 1 00                 | 1 193 4      | 98 0      | 0                           | 50   | 1 69987      | 77 3      | 0 6                         | 6 00 | 1 52893      | 0 6       | 0 4                         | 50    | 831 5        | 314 6     | 0 0                         |
| 1 05                 | 1 0808       | +295 7    | -0                          | 3 55 | 1 70359      | +71 3     | -0 6                        | 6 05 | 1 51869      | -206 9    | -0 4                        | 8 55  | 0 81553      | -314 2    | 0 0                         |
| 10                   | 1 81         | 93 3      | 3                           | 60   | 1 7070       | 65        | 0 6                         | 10   | 1 5 824      | 211 4     | 0 4                         | 60    | 79983        | 313 7     | +0 1                        |
| 15                   | 1 3741       | 90 7      | 0 3                         | 65   | 1 71011      | 59 4      | 6                           | 15   | 1 49755      | 215 9     | 0 4                         | 65    | 78416        | 313 1     | 0 1                         |
| 20                   | 1 5188       | 287 9     | 3                           | 70   | 1 71 94      | 53 6      | 0 6                         | 20   | 1 48665      | 220 0     | 4                           | 70    | 7685         | 312 4     | 1                           |
| 25                   | 1 6620       | 85 2      | 0 3                         | 75   | 1 71547      | 47 6      | 0 6                         | 25   | 1 47555      | 24 0      | 0 4                         | 75    | 75292        | 311 6     | 0 1                         |
| 1 30                 | 1 8 40       | +82 4     | -0 3                        | 3 80 | 1 71770      | -41 7     | -0 6                        | 6 30 | 1 464 5      | -2 8      | -0 4                        | 8 80  | 0 73736      | -310 6    | +0 1                        |
| 35                   | 1 29444      | 279 4     | 0 3                         | 85   | 1 71964      | 35 8      | 0 6                         | 35   | 1 45 73      | 32 3      | 0 4                         | 85    | 72186        | 309 6     | 0 1                         |
| 40                   | 1 3 834      | 76 3      | 3                           | 90   | 1 721 8      | 29 7      | 6                           | 40   | 1 44101      | 36 3      | 0 4                         | 90    | 70640        | 3 8 6     | 0 1                         |
| 45                   | 1 3 07       | 73 0      | 0 3                         | 95   | 1 7 261      | 3 5       | 0 6                         | 45   | 1 4 910      | 240 0     | 0 4                         | 95    | 69100        | 307       | 0 1                         |
| 50                   | 1 33564      | 69 8      | 0 3                         | 4 00 | 1 7 363      | 17 6      | 0 6                         | 50   | 1 41701      | 243 7     | 0 4                         | 9 00  | 67568        | 305 7     | 0 1                         |
| 1 55                 | 1 349 5      | +66 6     | -0 3                        | 4 05 | 1 7 437      | +11 7     | -0 6                        | 6 55 | 1 40473      | -247 7    | -0 4                        | 9 05  | 0 66043      | -304 3    | +0 1                        |
| 60                   | 1 36 30      | 63 1      | 0 4                         | 10   | 1 72480      | +5 7      | 0 6                         | 60   | 1 39226      | 251 3     | 0 3                         | 10    | 64525        | 302 8     | 0                           |
| 65                   | 1 37536      | 259 5     | 0 4                         | 15   | 1 7 494      | -0        | 0 6                         | 65   | 1 37962      | 254 5     | 0 3                         | 15    | 63015        | 301 1     | 0 2                         |
| 70                   | 1 388 5      | 56 0      | 0 4                         | 20   | 1 7 478      | 6 2       | 0 6                         | 70   | 1 36681      | 258 0     | 0 3                         | 20    | 61514        | 99 4      | 0                           |
| 75                   | 1 4 096      | 5 4       | 0 4                         | 25   | 1 7 43       | 12 1      | 0 6                         | 75   | 1 3538       | 61 4      | 0 3                         | 25    | 60021        | 297 6     | 2                           |
| 1 80                 | 1 41349      | +48 4     | -0 4                        | 4 30 | 1 7 357      | -18 1     | -0 6                        | 6 80 | 1 34067      | -264 6    | 0 3                         | 9 30  | 58538        | 295 6     | +0 2                        |
| 85                   | 1 4 581      | 44 4      | 4                           | 35   | 1 72251      | 4 1       | 6                           | 85   | 1 32736      | 67 8      | 3                           | 35    | 57 65        | 293 5     | 0 2                         |
| 90                   | 43793        | 40 5      | 4                           | 40   | 1 7 116      | 3 1       | 0 6                         | 90   | 1 31389      | 70 7      | 0 3                         | 40    | 556 3        | 91 3      | 0 2                         |
| 95                   | 44986        | 36 5      | 0 4                         | 45   | 1 7195       | 36 1      | 0 6                         | 95   | 1 300 9      | 73 5      | 0 3                         | 45    | 5415         | 289 0     | 2                           |
| 2 00                 | 1 46158      | 32 3      | 0 4                         | 50   | 1 71755      | 4 0       | 0 6                         | 7 00 | 1 28654      | 276 5     | 0 3                         | 50    | 5 713        | 286 6     | 2                           |
| 2 05                 | 1 473 9      | +2 8 1    | -0 4                        | 4 55 | 1 7153       | -47 9     | -0 6                        | 7 05 | 1 27 64      | -279 3    | -0 3                        | 9 55  | 0 51 86      | -284 1    | +0 3                        |
| 10                   | 1 48439      | 223 7     | 0 4                         | 60   | 1 71 76      | 53 8      | 6                           | 10   | 1 25861      | 8 0       | 0 3                         | 60    | 4987         | 281 5     | 3                           |
| 15                   | 1 49546      | 19 3      | 4                           | 65   | 1 7099       | 59 6      | 6                           | 15   | 1 24444      | 84 7      | 0 3                         | 65    | 48471        | 78 8      | 0 3                         |
| 20                   | 1 5 63       | 14 8      | 0 5                         | 70   | 1 70680      | 65 4      | 0 6                         | 20   | 1 3014       | 87 1      | 0 2                         | 70    | 47084        | 276 0     | 3                           |
| 25                   | 1 51694      | 10 1      | 5                           | 75   | 1 70338      | 71 3      | 0 6                         | 25   | 1 1573       | 289 4     | 0 2                         | 75    | 45711        | 273 2     | 0 3                         |
| 2 30                 | 1 5 733      | +5 6      | -5                          | 4 80 | 1 69967      | -77 0     | -0 6                        | 7 30 | 1 201        | -91 7     | -                           | 9 80  | 0 44352      | -7 3      | +0 3                        |
| 35                   | 1 5375       | 1 0       | 0 5                         | 85   | 1 69568      | 82 6      | 6                           | 35   | 1 18656      | 93 8      | 0 2                         | 85    | 43008        | 267       | 3                           |
| 40                   | 1 54743      | 196 1     | 0 5                         | 90   | 1 69141      | 88 4      | 6                           | 40   | 1 1718       | 295 9     | 0                           | 90    | 41680        | 64 0      | 0 3                         |
| 45                   | 1 55711      | 191       | 0 5                         | 95   | 1 68684      | 94 3      | 0 6                         | 45   | 1 15697      | 97 9      |                             | 95    | 4 368        | 260 8     | 0 3                         |
| 2 50                 | 1 56655      | +186 4    | -5                          | 5 00 | 1 68198      | -99 9     | -0 6                        | 7 50 | 1 14203      | -299 7    | -0 2                        | 10 00 | 0 39072      | -257 6    | +0 3                        |

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XVI continued

Equation of Longitude

Argument E

| 1          | 2             | 3                 | 4                     | 1          | 2             | 3                 | 4                     | 1          | 2             | 3                 | 4                     | 1          | 2             | 3                 | 4                     |
|------------|---------------|-------------------|-----------------------|------------|---------------|-------------------|-----------------------|------------|---------------|-------------------|-----------------------|------------|---------------|-------------------|-----------------------|
| E          | Equa-<br>tion | $\Delta$<br>od'or | $\frac{1}{2}\Delta^2$ | E          | Equa-<br>tion | $\Delta$<br>od'or | $\frac{1}{2}\Delta^2$ | E          | Equa-<br>tion | $\Delta$<br>od'or | $\frac{1}{2}\Delta^2$ | E          | Equa-<br>tion | $\Delta$<br>od'or | $\frac{1}{2}\Delta^2$ |
| d<br>10 00 | 0 39072       | -257,5            | +0,3                  | d<br>12 50 | 0 03515       | -5,2              | +0,6                  | d<br>15 00 | 0 37417       | +256,7            | +0,4                  | d<br>17 50 | 1 13573       | +305,7            | -0,2                  |
| 05         | 37793         | 254,0             | 0,4                   | 55         | 3504          | +0,8              | 0,6                   | 05         | 38710         | 260,3             | 0,3                   | 55         | 1 15097       | 303,9             | 0,2                   |
| 10         | 36532         | 250,4             | 0,4                   | 60         | 3523          | 7,0               | 0,6                   | 10         | 40020         | 263,7             | 0,3                   | 60         | 1 16612       | 302,0             | 0,2                   |
| 15         | 35289         | 246,9             | 0,4                   | 65         | 3574          | 13,1              | 0,6                   | 15         | 41347         | 267,1             | 0,3                   | 65         | 1 18117       | 299,8             | 0,2                   |
| 20         | 34063         | 243,4             | 0,4                   | 70         | 3654          | 18,9              | 0,6                   | 20         | 42691         | 270,4             | 0,3                   | 70         | 1 19610       | 297,5             | 0,2                   |
| 25         | 32855         | 239,6             | 0,4                   | 75         | 3763          | 24,8              | 0,6                   | 25         | 44051         | 273,7             | 0,3                   | 75         | 1 21092       | 295,2             | 0,2                   |
| 10 30      | 0 31667       | -235,7            | +0,4                  | 12 80      | 0 03902       | +30,8             | +0,6                  | 15 30      | 0 45428       | +276,9            | +0,3                  | 17 80      | 1 22562       | +292,6            | -0,3                  |
| 35         | 30500         | 231,4             | 0,4                   | 85         | 4071          | 36,8              | 0,6                   | 35         | 46820         | 279,9             | 0,3                   | 85         | 1 24018       | 290,0             | 0,3                   |
| 40         | 29353         | 227,2             | 0,4                   | 90         | 4270          | 42,8              | 0,6                   | 40         | 48227         | 283,0             | 0,3                   | 90         | 1 25462       | 287,5             | 0,3                   |
| 45         | 28226         | 223,4             | 0,4                   | 95         | 4499          | 48,8              | 0,6                   | 45         | 49650         | 286,0             | 0,3                   | 95         | 1 26893       | 284,8             | 0,3                   |
| 50         | 27119         | 219,2             | 0,4                   | 13 00      | 4758          | 54,7              | 0,6                   | 50         | 51087         | 288,7             | 0,3                   | 18 00      | 1 28310       | 281,9             | 0,3                   |
| 10 55      | 0 26034       | -214,8            | +0,4                  | 13 05      | 0 05046       | +60,5             | +0,6                  | 15 55      | 0 52537       | +291,0            | +0,2                  | 18 05      | 1 29712       | +278,8            | -0,3                  |
| 60         | 24971         | 210,5             | 0,4                   | 10         | 5363          | 66,5              | 0,6                   | 60         | 53998         | 293,4             | 0,2                   | 10         | 1 31098       | 275,7             | 0,3                   |
| 65         | 23929         | 206,1             | 0,5                   | 15         | 5711          | 72,4              | 0,6                   | 65         | 55471         | 295,8             | 0,2                   | 15         | 1 32469       | 272,6             | 0,3                   |
| 70         | 22910         | 201,6             | 0,5                   | 20         | 6087          | 78,2              | 0,6                   | 70         | 56956         | 298,3             | 0,2                   | 20         | 1 33824       | 269,2             | 0,3                   |
| 75         | 21913         | 197,0             | 0,5                   | 25         | 6493          | 84,2              | 0,6                   | 75         | 58454         | 300,7             | 0,2                   | 25         | 1 35161       | 265,8             | 0,3                   |
| 10 80      | 0 20940       | -192,3            | +0,5                  | 13 30      | 0 06929       | +89,9             | +0,6                  | 15 80      | 0 59963       | +302,8            | +0,2                  | 18 30      | 1 36482       | +262,5            | -0,3                  |
| 85         | 19990         | 187,8             | 0,5                   | 35         | 7392          | 95,5              | 0,6                   | 85         | 61482         | 304,7             | 0,2                   | 35         | 1 37786       | 259,0             | 0,4                   |
| 90         | 19062         | 183,1             | 0,5                   | 40         | 7884          | 101,4             | 0,6                   | 90         | 63010         | 306,5             | 0,2                   | 40         | 1 39072       | 255,3             | 0,4                   |
| 95         | 18159         | 178,0             | 0,5                   | 45         | 8406          | 107,1             | 0,6                   | 95         | 64547         | 308,2             | 0,2                   | 45         | 1 40339       | 251,4             | 0,4                   |
| 11 00      | 17282         | 173,0             | 0,5                   | 50         | 8955          | 112,7             | 0,6                   | 16 00      | 66092         | 309,9             | 0,2                   | 50         | 1 41586       | 247,6             | 0,4                   |
| 11 05      | 0 16429       | -168,2            | +0,5                  | 13 55      | 0 09533       | +118,4            | +0,6                  | 16 05      | 0 67646       | +311,6            | +0,2                  | 18 55      | 1 42815       | +243,9            | -0,4                  |
| 10         | 15600         | 163,2             | 0,5                   | 60         | 10139         | 124,0             | 0,6                   | 10         | 69208         | 312,9             | 0,1                   | 60         | 1 44025       | 239,8             | 0,4                   |
| 15         | 14797         | 158,0             | 0,5                   | 65         | 10773         | 129,6             | 0,6                   | 15         | 70775         | 314,1             | 0,1                   | 65         | 1 45213       | 235,6             | 0,4                   |
| 20         | 14020         | 152,9             | 0,5                   | 70         | 11435         | 135,1             | 0,5                   | 20         | 72349         | 315,4             | 0,1                   | 70         | 1 46381       | 231,5             | 0,4                   |
| 25         | 13268         | 147,8             | 0,5                   | 75         | 12124         | 140,4             | 0,5                   | 25         | 73929         | 316,5             | 0,1                   | 75         | 1 47528       | 227,3             | 0,4                   |
| 11 30      | 0 12542       | -142,6            | +0,5                  | 13 80      | 0 12839       | +145,9            | +0,5                  | 16 30      | 0 75514       | +317,4            | +0,1                  | 18 80      | 1 48654       | +222,8            | -0,4                  |
| 35         | 11842         | 137,3             | 0,5                   | 85         | 13583         | 151,5             | 0,5                   | 35         | 77103         | 318,2             | 0,1                   | 85         | 1 49756       | 218,3             | 0,4                   |
| 40         | 11169         | 132,0             | 0,5                   | 90         | 14354         | 156,8             | 0,5                   | 40         | 78696         | 319,0             | 0,1                   | 90         | 1 50837       | 214,0             | 0,4                   |
| 45         | 10522         | 126,6             | 0,6                   | 95         | 15151         | 162,0             | 0,5                   | 45         | 80294         | 319,7             | +0,1                  | 95         | 1 51896       | 209,5             | 0,5                   |
| 50         | 09903         | 120,9             | 0,6                   | 14 00      | 15974         | 167,2             | 0,5                   | 50         | 81893         | 320,2             | 0,0                   | 19 00      | 1 52932       | 204,7             | 0,5                   |
| 11 55      | 0 09313       | -115,3            | +0,6                  | 14 05      | 0 16823       | +172,3            | +0,5                  | 16 55      | 0 83495       | +320,5            | 0,0                   | 19 05      | 1 53943       | +199,9            | -0,5                  |
| 60         | 8750          | 109,9             | 0,6                   | 10         | 17697         | 177,1             | 0,5                   | 60         | 85098         | 320,7             | 0,0                   | 10         | 1 54931       | 195,3             | 0,5                   |
| 65         | 8214          | 104,4             | 0,6                   | 15         | 18596         | 182,3             | 0,5                   | 65         | 86702         | 320,9             | 0,0                   | 15         | 1 55896       | 190,4             | 0,5                   |
| 70         | 7706          | 98,7              | 0,6                   | 20         | 19520         | 187,2             | 0,5                   | 70         | 88307         | 321,0             | 0,0                   | 20         | 1 56835       | 185,3             | 0,5                   |
| 75         | 7227          | 93,1              | 0,6                   | 25         | 20468         | 192,2             | 0,5                   | 75         | 89912         | 320,9             | 0,0                   | 25         | 1 57749       | 180,3             | 0,5                   |
| 11 80      | 0 06775       | -87,5             | +0,6                  | 14 30      | 0 21442       | +197,2            | +0,5                  | 16 80      | 0 91516       | +320,6            | 0,0                   | 19 30      | 1 58638       | +175,4            | -0,5                  |
| 85         | 6352          | 81,7              | 0,6                   | 35         | 22440         | 201,9             | 0,5                   | 85         | 93118         | 320,3             | 0,0                   | 35         | 1 59503       | 170,4             | 0,5                   |
| 90         | 5958          | 76,0              | 0,6                   | 40         | 23461         | 206,5             | 0,5                   | 90         | 94719         | 319,9             | -0,1                  | 40         | 1 60342       | 165,1             | 0,5                   |
| 95         | 5592          | 70,3              | 0,6                   | 45         | 24505         | 211,2             | 0,5                   | 95         | 96317         | 319,4             | 0,1                   | 45         | 1 61154       | 159,8             | 0,5                   |
| 12 00      | 5255          | 64,3              | 0,6                   | 50         | 25573         | 215,8             | 0,4                   | 17 00      | 97913         | 318,8             | 0,1                   | 50         | 1 61940       | 154,7             | 0,5                   |
| 12 05      | 0 04949       | -58,4             | +0,6                  | 14 55      | 0 26663       | +220,2            | +0,4                  | 17 05      | 0 99505       | +317,9            | -0,1                  | 19 55      | 1 62701       | +149,4            | -0,5                  |
| 10         | 4671          | 52,6              | 0,6                   | 60         | 27775         | 224,6             | 0,4                   | 10         | 1 01092       | 317,0             | 0,1                   | 60         | 1 63434       | 143,9             | 0,5                   |
| 15         | 4423          | 46,8              | 0,6                   | 65         | 28909         | 228,8             | 0,4                   | 15         | 1 02675       | 316,1             | 0,1                   | 65         | 1 64140       | 138,3             | 0,6                   |
| 20         | 4203          | 40,9              | 0,6                   | 70         | 30063         | 233,0             | 0,4                   | 20         | 1 04253       | 314,9             | 0,1                   | 70         | 1 64817       | 132,9             | 0,6                   |
| 25         | 4014          | 34,8              | 0,6                   | 75         | 31239         | 237,2             | 0,4                   | 25         | 1 05824       | 313,6             | 0,1                   | 75         | 1 65469       | 127,6             | 0,6                   |
| 12 30      | 0 03855       | -28,8             | +0,6                  | 14 80      | 0 32435       | +241,3            | +0,4                  | 17 30      | 1 07389       | +312,3            | -0,1                  | 19 80      | 1 66093       | +121,9            | -0,6                  |
| 35         | 3726          | 22,9              | 0,6                   | 85         | 33652         | 245,3             | 0,4                   | 35         | 1 08947       | 310,9             | 0,1                   | 85         | 1 66688       | 116,2             | 0,6                   |
| 40         | 3626          | 17,0              | 0,6                   | 90         | 34888         | 249,1             | 0,4                   | 40         | 1 10498       | 309,3             | 0,2                   | 90         | 1 67255       | 110,9             | 0,6                   |
| 45         | 3556          | 11,1              | 0,6                   | 95         | 36143         | 252,9             | 0,4                   | 45         | 1 12040       | 307,5             | 0,2                   | 95         | 1 67797       | 105,3             | 0,6                   |
| 12 50      | 0 03515       | -5,2              | +0,6                  | 15 00      | 0 37417       | +256,7            | +0,4                  | 17 50      | 1 13573       | +305,7            | -0,2                  | 20 00      | 1 68308       | +99,1             | -0,6                  |

Applied Constant:  $+0^{\circ}88000$ .

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XVII

Equations of Longitude

XVIII

| F   | Equation | $\Delta$<br>0 1 | F   | Equation | $\Delta$<br>1 |
|-----|----------|-----------------|-----|----------|---------------|
| 00  | 0001 0   | + 1 3           | 300 | 0 004    | - 1 0         |
| 06  | 108      | 1 3             | 306 | 36       | 0 9           |
| 12  | 115      | 1               | 312 | 31       | 0 8           |
| 18  | 1        | 1 3             | 318 | 26       | 0 8           |
| 24  | 130      | 1 3             | 324 | 21       | 0 8           |
| 30  | 137      | 1               | 330 | 16       | 0 7           |
| 36  | 0 0144   | + 1 1           | 336 | 0 00012  | - 0 6         |
| 42  | 15       | 1 1             | 342 | 9        | 0 5           |
| 48  | 157      | 1 1             | 348 | 6        | 0 4           |
| 54  | 163      | 0 9             | 354 | 4        | 0 3           |
| 60  | 168      | 0 9             | 360 |          | 0 3           |
| 66  | 0 0 174  | + 0 9           | 366 | 0 00001  | - 0           |
| 72  | 179      | 0 8             | 372 | 0        | - 0 1         |
| 78  | 183      | 0 7             | 378 | 0        | 0 0           |
| 84  | 187      | 0 6             | 384 | 0        | + 0 1         |
| 90  | 190      | 0 5             | 390 | 1        | 0 3           |
| 96  | 0 00193  | + 0 5           | 396 | 0 00003  | + 0 3         |
| 102 | 196      | 0 4             | 402 | 5        | 0 4           |
| 108 | 198      | 0 3             | 408 | 8        | 0 5           |
| 114 | 199      | 0               | 414 | 11       | 6             |
| 120 | 2 0      | + 0 1           | 420 | 15       | 0 7           |
| 126 | 0 002 0  | 0 0             | 426 | 0 00019  | + 0 7         |
| 132 | 200      | - 0 1           | 432 | 23       | 0 8           |
| 138 | 199      | 0 3             | 438 | 28       | 0 9           |
| 144 | 197      | 0 3             | 444 | 34       | 1 0           |
| 150 | 195      | 0 3             | 450 | 40       | 1 0           |
| 156 | 0 0193   | - 0 4           | 456 | 0 00046  | + 1 0         |
| 162 | 190      | 0 6             | 462 | 52       | 1 1           |
| 168 | 186      | 0 7             | 468 | 59       | 1             |
| 174 | 18       | 0 7             | 474 | 66       | 1 2           |
| 180 | 178      | 0 8             | 480 | 73       | 1 3           |
| 186 | 0 00173  | - 0 9           | 486 | 0 00081  | + 1 3         |
| 192 | 167      | 1 0             | 492 | 88       | 1 2           |
| 198 | 161      | 1 0             | 498 | 95       | 1 3           |
| 204 | 155      | 1 0             | 504 | 103      | 1 3           |
| 210 | 149      | 1 1             | 510 | 111      | 1 3           |
| 216 | 0 0014   | - 1 2           | 516 | 0 0 118  | + 1           |
| 222 | 135      | 1               | 522 | 125      | 1 3           |
| 228 | 128      | 1               | 528 | 133      | 1 3           |
| 234 | 121      | 1 3             | 534 | 140      | 1 1           |
| 240 | 113      | 1 3             | 540 | 146      | 1 1           |
| 246 | 0 00106  | - 1 3           | 546 | 0 00153  | + 1 1         |
| 252 | 98       | 1 3             | 552 | 159      | 1 0           |
| 258 | 91       | 1 3             | 558 | 165      | 1 0           |
| 264 | 83       | 1 3             | 564 | 171      | 0 9           |
| 270 | 76       | 1 2             | 570 | 176      | 0 8           |
| 276 | 0 00069  | - 1             | 576 | 0 0018   | + 0 7         |
| 282 | 62       | 1 2             | 582 | 184      | 0 7           |
| 288 | 55       | 1               | 588 | 188      | 0 6           |
| 294 | 48       | 1 1             | 594 | 191      | 0 5           |
| 300 | 0 0004   | - 1 0           | 600 | 0 00194  | + 0 5         |

Appli d C t t + ∞ ∞

| G  | Equation | $\Delta$<br>0 1 | G   | Equation | $\Delta$<br>0 1 |
|----|----------|-----------------|-----|----------|-----------------|
| 00 | 0 00150  | + 9             | 50  | 0 00082  | - 7             |
| 1  | 159      | 9               | 1   | 75       | 7               |
| 2  | 168      | 9               | 2   | 68       | 7               |
| 3  | 177      | 9               | 3   | 62       | 6               |
| 4  | 185      | 9               | 4   | 56       | 6               |
| 5  | 194      | 9               | 5   | 51       | 5               |
| 06 | 0 0020   | + 8             | 56  | 0 00046  | - 5             |
| 7  | 210      | 8               | 7   | 4        | 4               |
| 8  | 217      | 7               | 8   | 39       | 3               |
| 9  | 24       | 7               | 9   | 36       | 3               |
| 10 | 231      | 7               | 60  | 34       | 2               |
| 11 | 0 00 37  | + 6             | 61  | 0 0003   | - 2             |
| 2  | 43       | 6               | 2   | 31       | - 1             |
| 3  | 248      | 5               | 3   | 31       | 0               |
| 4  | 53       | 5               | 4   | 31       | + 1             |
| 5  | 57       | 4               | 5   | 32       | 2               |
| 16 | 0 00261  | + 4             | 66  | 0 00034  | + 3             |
| 7  | 64       | 3               | 7   | 37       | 3               |
| 8  | 66       | 2               | 8   | 40       | 3               |
| 9  | 268      | 2               | 9   | 43       | 4               |
| 20 | 269      | + 1             | 70  | 48       | 5               |
| 21 | 0 00269  | 0               | 71  | 0 00053  | + 5             |
| 2  | 269      | - 1             | 2   | 58       | 6               |
| 3  | 268      | 2               | 3   | 64       | 6               |
| 4  | 266      | 2               | 4   | 7        | 7               |
| 5  | 264      | 3               | 5   | 77       | 7               |
| 26 | 0 00261  | - 4             | 76  | 0 00084  | + 8             |
| 7  | 257      | 4               | 7   | 92       | 8               |
| 8  | 53       | 5               | 8   | 1 0      | 8               |
| 9  | 248      | 5               | 9   | 108      | 9               |
| 30 | 243      | 6               | 80  | 117      | 9               |
| 31 | 0 00237  | - 6             | 81  | 0 00125  | + 9             |
| 2  | 231      | 7               | 2   | 134      | 9               |
| 3  | 224      | 8               | 3   | 143      | 9               |
| 4  | 216      | 8               | 4   | 152      | 9               |
| 5  | 209      | 8               | 5   | 161      | 9               |
| 36 | 0 00201  | - 8             | 86  | 0 00170  | + 9             |
| 7  | 193      | 9               | 7   | 179      | 9               |
| 8  | 184      | 9               | 8   | 187      | 9               |
| 9  | 176      | 9               | 9   | 196      | 9               |
| 40 | 167      | 9               | 90  | 204      | 8               |
| 41 | 0 00158  | - 9             | 91  | 0 00 12  | + 8             |
| 2  | 149      | 9               | 2   | 19       | 7               |
| 3  | 14       | 9               | 3   | 226      | 7               |
| 4  | 131      | 9               | 4   | 233      | 7               |
| 5  | 12       | 9               | 5   | 239      | 6               |
| 46 | 0 00114  | - 9             | 96  | 0 00245  | + 6             |
| 7  | 105      | 9               | 7   | 250      | 5               |
| 8  | 97       | 8               | 8   | 254      | 4               |
| 9  | 89       | 8               | 9   | 258      | 4               |
| 50 | 0 00082  | - 7             | 100 | 0 00262  | + 4             |

Appli d C ta t + ∞ 5

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XIX

Equation of Longitude

Argument H

| 1   | 2        | 3                     | 1    | 2        | 3                     | 1    | 2        | 3                     | 1    | 2        | 3                     |
|-----|----------|-----------------------|------|----------|-----------------------|------|----------|-----------------------|------|----------|-----------------------|
| H   | Equation | $\Delta_{0d \cdot 1}$ | H    | Equation | $\Delta_{0d \cdot 1}$ | H    | Equation | $\Delta_{0d \cdot 1}$ | H    | Equation | $\Delta_{0d \cdot 1}$ |
| d   | o        |                       | d    | o        |                       | d    | o        |                       | d    | o        |                       |
| 0.0 | 0.00700  | + 24                  | 5.0  | 0.01307  | - 7                   | 10.0 | 0.00344  | - 20                  | 15.0 | 0.00301  | + 19                  |
| .1  | 724      | 24                    | .1   | 1300     | 8                     | .1   | 325      | 19                    | .1   | 320      | 19                    |
| .2  | 747      | 24                    | .2   | 1292     | 9                     | .2   | 306      | 19                    | .2   | 339      | 20                    |
| .3  | 771      | 24                    | .3   | 1283     | 10                    | .3   | 288      | 18                    | .3   | 359      | 20                    |
| .4  | 795      | 23                    | .4   | 1273     | 11                    | .4   | 270      | 18                    | .4   | 379      | 21                    |
| .5  | 818      | 23                    | .5   | 1262     | 11                    | .5   | 253      | 17                    | .5   | 400      | 21                    |
| 0.6 | 0.00841  | + 23                  | 5.6  | 0.01251  | - 12                  | 10.6 | 0.00236  | - 17                  | 15.6 | 0.00421  | + 21                  |
| .7  | 864      | 23                    | .7   | 1238     | 13                    | .7   | 220      | 16                    | .7   | 442      | 22                    |
| .8  | 887      | 23                    | .8   | 1225     | 14                    | .8   | 205      | 15                    | .8   | 464      | 22                    |
| .9  | 910      | 22                    | .9   | 1211     | 14                    | .9   | 191      | 14                    | .9   | 486      | 23                    |
| 1.0 | 932      | 22                    | 6.0  | 1197     | 15                    | 11.0 | 177      | 13                    | 16.0 | 509      | 23                    |
| 1.1 | 0.00954  | + 21                  | 6.1  | 0.01182  | - 15                  | 11.1 | 0.00164  | - 13                  | 16.1 | 0.00532  | + 23                  |
| .2  | 975      | 21                    | .2   | 1167     | 16                    | .2   | 151      | 12                    | .2   | 555      | 23                    |
| .3  | 996      | 21                    | .3   | 1150     | 17                    | .3   | 140      | 11                    | .3   | 578      | 23                    |
| .4  | 1017     | 20                    | .4   | 1133     | 18                    | .4   | 129      | 10                    | .4   | 601      | 24                    |
| .5  | 1037     | 20                    | .5   | 1115     | 18                    | .5   | 119      | 9                     | .5   | 625      | 24                    |
| 1.6 | 0.01057  | + 20                  | 6.6  | 0.01097  | - 19                  | 11.6 | 0.00110  | - 8                   | 16.6 | 0.00649  | + 24                  |
| .7  | 1077     | 19                    | .7   | 1078     | 19                    | .7   | 102      | 8                     | .7   | 673      | 24                    |
| .8  | 1096     | 19                    | .8   | 1059     | 20                    | .8   | 94       | 7                     | .8   | 696      | 24                    |
| .9  | 1114     | 18                    | .9   | 1039     | 20                    | .9   | 88       | 6                     | .9   | 720      | 24                    |
| 2.0 | 1132     | 18                    | 7.0  | 1019     | 21                    | 12.0 | 82       | 6                     | 17.0 | 743      | 23                    |
| 2.1 | 0.01149  | + 17                  | 7.1  | 0.00998  | - 21                  | 12.1 | 0.00077  | - 5                   | 17.1 | 0.00767  | + 24                  |
| .2  | 1165     | 16                    | .2   | 977      | 21                    | .2   | 73       | 4                     | .2   | 791      | 23                    |
| .3  | 1181     | 15                    | .3   | 956      | 22                    | .3   | 70       | 3                     | .3   | 814      | 23                    |
| .4  | 1196     | 14                    | .4   | 934      | 22                    | .4   | 67       | 2                     | .4   | 837      | 23                    |
| .5  | 1210     | 14                    | .5   | 912      | 23                    | .5   | 65       | - 1                   | .5   | 860      | 23                    |
| 2.6 | 0.01224  | + 13                  | 7.6  | 0.00889  | - 23                  | 12.6 | 0.00065  | 0                     | 17.6 | 0.00883  | + 23                  |
| .7  | 1237     | 13                    | .7   | 866      | 23                    | .7   | 66       | + 1                   | .7   | 906      | 22                    |
| .8  | 1250     | 12                    | .8   | 843      | 23                    | .8   | 67       | 2                     | .8   | 928      | 22                    |
| .9  | 1261     | 11                    | .9   | 820      | 23                    | .9   | 69       | 3                     | .9   | 950      | 22                    |
| 3.0 | 1272     | 10                    | 8.0  | 797      | 23                    | 13.0 | 72       | 4                     | 18.0 | 972      | 21                    |
| 3.1 | 0.01282  | + 9                   | 8.1  | 0.00774  | - 24                  | 13.1 | 0.00076  | + 4                   | 18.1 | 0.00993  | + 21                  |
| .2  | 1291     | 9                     | .2   | 750      | 24                    | .2   | 80       | 5                     | .2   | 1014     | 21                    |
| .3  | 1299     | 8                     | .3   | 726      | 24                    | .3   | 86       | 6                     | .3   | 1034     | 20                    |
| .4  | 1307     | 7                     | .4   | 702      | 24                    | .4   | 92       | 7                     | .4   | 1054     | 20                    |
| .5  | 1313     | 6                     | .5   | 679      | 24                    | .5   | 100      | 8                     | .5   | 1073     | 19                    |
| 3.6 | 0.01319  | + 5                   | 8.6  | 0.00655  | - 24                  | 13.6 | 0.00108  | + 9                   | 18.6 | 0.01092  | + 19                  |
| .7  | 1324     | 4                     | .7   | 631      | 24                    | .7   | 117      | 9                     | .7   | 1110     | 18                    |
| .8  | 1328     | 3                     | .8   | 607      | 23                    | .8   | 126      | 10                    | .8   | 1128     | 17                    |
| .9  | 1331     | 2                     | .9   | 584      | 23                    | .9   | 137      | 11                    | .9   | 1145     | 17                    |
| 4.0 | 1333     | 1                     | 9.0  | 561      | 23                    | 14.0 | 148      | 12                    | 19.0 | 1162     | 17                    |
| 4.1 | 0.01334  | + 1                   | 9.1  | 0.00538  | - 23                  | 14.1 | 0.00160  | + 13                  | 19.1 | 0.01178  | + 16                  |
| .2  | 1335     | 0                     | .2   | 515      | 23                    | .2   | 173      | 14                    | .2   | 1194     | 15                    |
| .3  | 1334     | - 1                   | .3   | 492      | 22                    | .3   | 187      | 14                    | .3   | 1208     | 14                    |
| .4  | 1333     | 2                     | .4   | 470      | 22                    | .4   | 201      | 15                    | .4   | 1222     | 14                    |
| .5  | 1331     | 3                     | .5   | 448      | 21                    | .5   | 216      | 16                    | .5   | 1235     | 13                    |
| 4.6 | 0.01328  | - 4                   | 9.6  | 0.00427  | - 21                  | 14.6 | 0.00232  | + 16                  | 19.6 | 0.01247  | + 12                  |
| .7  | 1324     | 5                     | .7   | 406      | 21                    | .7   | 248      | 17                    | .7   | 1259     | 11                    |
| .8  | 1319     | 6                     | .8   | 385      | 21                    | .8   | 265      | 18                    | .8   | 1270     | 10                    |
| .9  | 1313     | 6                     | .9   | 364      | 20                    | .9   | 283      | 18                    | .9   | 1280     | 10                    |
| 5.0 | 0.01307  | - 7                   | 10.0 | 0.00344  | - 20                  | 15.0 | 0.00301  | + 19                  | 20.0 | 0.01289  | + 9                   |

Applied Constant: +0.00700.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XX

Equation of Longitude

Argument  $\alpha$

|             |          | 3        |             |          | 3        |             |          | 3        |             |          | 3        |             |          | 3        |
|-------------|----------|----------|-------------|----------|----------|-------------|----------|----------|-------------|----------|----------|-------------|----------|----------|
|             | Equation | $\Delta$ | $\alpha$    | Equation | $\Delta$ | $\alpha$    | Equation | $\Delta$ | $\alpha$    | Equation | $\Delta$ | $\alpha$    | Equation | $\Delta$ |
| <b>0</b>    | 003500   | -50      | <b>1000</b> | 00279    | -        | <b>2000</b> | 00786    | +42      | <b>3000</b> | 00643    | +19      | <b>4000</b> | 005087   | -44      |
| <b>20</b>   | 34 0     | 50       | <b>1020</b> | 276      | - 1      | <b>2020</b> | 2871     | 43       | <b>3020</b> | 6468     | 18       | <b>4020</b> | 4999     | 44       |
| <b>40</b>   | 3 99     | 50       | <b>1040</b> | 75       | 0        | <b>2040</b> | 957      | 43       | <b>3040</b> | 6503     | 17       | <b>4040</b> | 4910     | 45       |
| <b>60</b>   | 3199     | 5        | <b>1060</b> | 77       | +        | <b>2060</b> | 3 43     | 43       | <b>3060</b> | 6534     | 15       | <b>4060</b> | 4820     | 45       |
| <b>80</b>   | 31 1     | 50       | <b>1080</b> | 8        | 3        | <b>2080</b> | 31 8     | 43       | <b>3080</b> | 6564     | 15       | <b>4080</b> | 4730     | 46       |
| <b>100</b>  | 3 1      | 50       | <b>1100</b> | 9        | 5        | <b>2100</b> | 3 15     | 43       | <b>3100</b> | 659      | 13       | <b>4100</b> | 4637     | 47       |
| <b>120</b>  | 002903   | -49      | <b>1120</b> | 000301   | + 6      | <b>2120</b> | 0033 1   | +43      | <b>3120</b> | 006617   | +12      | <b>4120</b> | 004543   | -47      |
| <b>140</b>  | 805      | 49       | <b>1140</b> | 314      | 7        | <b>2140</b> | 3387     | 43       | <b>3140</b> | 6639     | 11       | <b>4140</b> | 4449     | 48       |
| <b>160</b>  | 7 8      | 48       | <b>1160</b> | 330      | 9        | <b>2160</b> | 3473     | 43       | <b>3160</b> | 6659     | 9        | <b>4160</b> | 4353     | 48       |
| <b>180</b>  | 612      | 48       | <b>1180</b> | 349      | 10       | <b>2180</b> | 3559     | 43       | <b>3180</b> | 6676     | 8        | <b>4180</b> | 4256     | 49       |
| <b>200</b>  | 517      | 48       | <b>1200</b> | 369      | 11       | <b>2200</b> | 3646     | 43       | <b>3200</b> | 6691     | 7        | <b>4200</b> | 4159     | 49       |
| <b>220</b>  | 0024 2   | -47      | <b>1220</b> | 000392   | + 1      | <b>2220</b> | 003732   | +43      | <b>3220</b> | 00670    | + 5      | <b>4220</b> | 004061   | -50      |
| <b>240</b>  | 23 9     | 46       | <b>1240</b> | 418      | 14       | <b>2240</b> | 3819     | 43       | <b>3240</b> | 671      | 4        | <b>4240</b> | 3961     | 50       |
| <b>260</b>  | 2 37     | 46       | <b>1260</b> | 446      | 15       | <b>2260</b> | 3904     | 43       | <b>3260</b> | 6719     | 3        | <b>4260</b> | 3863     | 50       |
| <b>280</b>  | 145      | 46       | <b>1280</b> | 477      | 16       | <b>2280</b> | 3990     | 43       | <b>3280</b> | 6723     | +        | <b>4280</b> | 3763     | 50       |
| <b>300</b>  | 2055     | 45       | <b>1300</b> | 510      | 17       | <b>2300</b> | 4076     | 43       | <b>3300</b> | 67 5     | 0        | <b>4300</b> | 3663     | 50       |
| <b>320</b>  | 0 1967   | -44      | <b>1320</b> | 00545    | +18      | <b>2320</b> | 004161   | +43      | <b>3320</b> | 006724   | - 1      | <b>4320</b> | 003563   | -50      |
| <b>340</b>  | 1880     | 43       | <b>1340</b> | 582      | 20       | <b>2340</b> | 4246     | 42       | <b>3340</b> | 6720     | 3        | <b>4340</b> | 3462     | 50       |
| <b>360</b>  | 1796     | 42       | <b>1360</b> | 6 3      | 1        | <b>2360</b> | 4330     | 4        | <b>3360</b> | 6712     | 5        | <b>4360</b> | 336      | 50       |
| <b>380</b>  | 1713     | 41       | <b>1380</b> | 665      |          | <b>2380</b> | 4413     | 42       | <b>3380</b> | 670      | 6        | <b>4380</b> | 3262     | 50       |
| <b>400</b>  | 1631     | 40       | <b>1400</b> | 710      | 23       | <b>2400</b> | 4496     | 42       | <b>3400</b> | 6689     | 7        | <b>4400</b> | 3163     | 50       |
| <b>420</b>  | 00 55    | -39      | <b>1420</b> | 000756   | + 4      | <b>2420</b> | 004579   | +41      | <b>3420</b> | 006673   | - 9      | <b>4420</b> | 003063   | -50      |
| <b>440</b>  | 1474     | 38       | <b>1440</b> | 805      | 25       | <b>2440</b> | 4660     | 41       | <b>3440</b> | 6655     | 10       | <b>4440</b> | 2965     | 49       |
| <b>460</b>  | 1398     | 38       | <b>1460</b> | 854      | 25       | <b>2460</b> | 4741     | 40       | <b>3460</b> | 6634     | 11       | <b>4460</b> | 2867     | 49       |
| <b>480</b>  | 13 4     | 37       | <b>1480</b> | 906      | 27       | <b>2480</b> | 4821     | 40       | <b>3480</b> | 6610     | 13       | <b>4480</b> | 2769     | 49       |
| <b>500</b>  | 1 52     | 36       | <b>1500</b> | 96       | 8        | <b>2500</b> | 490      | 40       | <b>3500</b> | 6583     | 14       | <b>4500</b> | 2673     | 48       |
| <b>520</b>  | 001182   | -34      | <b>1520</b> | 001019   | +29      | <b>2520</b> | 004979   | +39      | <b>3520</b> | 006554   | -15      | <b>4520</b> | 00 576   | -48      |
| <b>540</b>  | 1115     | 33       | <b>1540</b> | 1077     | 30       | <b>2540</b> | 5057     | 39       | <b>3540</b> | 6522     | 17       | <b>4540</b> | 2481     | 47       |
| <b>560</b>  | 1 5      | 3        | <b>1560</b> | 1137     | 3        | <b>2560</b> | 5133     | 38       | <b>3560</b> | 6486     | 18       | <b>4560</b> | 2387     | 47       |
| <b>580</b>  | 988      | 31       | <b>1580</b> | 1198     | 31       | <b>2580</b> | 5208     | 37       | <b>3580</b> | 6449     | 20       | <b>4580</b> | 2294     | 46       |
| <b>600</b>  | 928      | 30       | <b>1600</b> | 1 6      | 3        | <b>2600</b> | 5 8      | 37       | <b>3600</b> | 6408     | 21       | <b>4600</b> | 2202     | 46       |
| <b>620</b>  | 00 87    | -28      | <b>1620</b> | 0013 6   | +33      | <b>2620</b> | 005355   | +36      | <b>3620</b> | 006364   | -23      | <b>4620</b> | 002111   | -45      |
| <b>640</b>  | 815      | 7        | <b>1640</b> | 1393     | 34       | <b>2640</b> | 5426     | 35       | <b>3640</b> | 6318     | 24       | <b>4640</b> | 2023     | 44       |
| <b>660</b>  | 76       | 6        | <b>1660</b> | 1460     | 34       | <b>2660</b> | 5496     | 35       | <b>3660</b> | 6270     | 5        | <b>4660</b> | 1935     | 44       |
| <b>680</b>  | 71       | 25       | <b>1680</b> | 15 9     | 35       | <b>2680</b> | 5566     | 34       | <b>3680</b> | 6 19     | 6        | <b>4680</b> | 1849     | 43       |
| <b>700</b>  | 664      | 24       | <b>1700</b> | 1600     | 36       | <b>2700</b> | 563      | 33       | <b>3700</b> | 6165     | 27       | <b>4700</b> | 1764     | 42       |
| <b>720</b>  | 000619   | -        | <b>1720</b> | 001671   | +36      | <b>2720</b> | 005698   | +33      | <b>3720</b> | 006108   | - 9      | <b>4720</b> | 001681   | -41      |
| <b>740</b>  | 577      | 0        | <b>1740</b> | 1745     | 37       | <b>2740</b> | 5763     | 32       | <b>3740</b> | 6050     | 30       | <b>4740</b> | 1601     | 40       |
| <b>760</b>  | 538      | 19       | <b>1760</b> | 1819     | 38       | <b>2760</b> | 5826     | 31       | <b>3760</b> | 5989     | 31       | <b>4760</b> | 1521     | 39       |
| <b>780</b>  | 501      | 18       | <b>1780</b> | 1895     | 38       | <b>2780</b> | 5887     | 30       | <b>3780</b> | 59 6     | 32       | <b>4780</b> | 1444     | 38       |
| <b>800</b>  | 465      | 17       | <b>1800</b> | 197      | 39       | <b>2800</b> | 5945     | 29       | <b>3800</b> | 5860     | 34       | <b>4800</b> | 1370     | 37       |
| <b>820</b>  | 000435   | -15      | <b>1820</b> | 002 49   | +39      | <b>2820</b> | 006003   | +29      | <b>3820</b> | 005791   | -35      | <b>4820</b> | 001297   | -36      |
| <b>840</b>  | 407      | 14       | <b>1840</b> | 21 8     | 40       | <b>2840</b> | 6 59     | 27       | <b>3840</b> | 5722     | 35       | <b>4840</b> | 1226     | 35       |
| <b>860</b>  | 381      | 1        | <b>1860</b> | 2 08     | 4        | <b>2860</b> | 6112     | 6        | <b>3860</b> | 5650     | 37       | <b>4860</b> | 1157     | 34       |
| <b>880</b>  | 359      | 11       | <b>1880</b> | 88       | 41       | <b>2880</b> | 6163     | 26       | <b>3880</b> | 5575     | 38       | <b>4880</b> | 1090     | 33       |
| <b>900</b>  | 338      | 1        | <b>1900</b> | 2370     | 41       | <b>2900</b> | 6214     | 5        | <b>3900</b> | 5498     | 39       | <b>4900</b> | 1027     | 31       |
| <b>920</b>  | 0003 1   | - 8      | <b>1920</b> | 002452   | +41      | <b>2920</b> | 006262   | +23      | <b>3920</b> | 005420   | -4       | <b>4920</b> | 000966   | -3       |
| <b>940</b>  | 306      | 7        | <b>1940</b> | 2535     | 4        | <b>2940</b> | 6307     | 22       | <b>3940</b> | 5339     | 41       | <b>4940</b> | 906      | 29       |
| <b>960</b>  | 94       | 5        | <b>1960</b> | 618      | 4        | <b>2960</b> | 6351     | 21       | <b>3960</b> | 5256     | 42       | <b>4960</b> | 849      | 8        |
| <b>980</b>  | 85       | 4        | <b>1980</b> | 270      | 42       | <b>2980</b> | 6392     | 0        | <b>3980</b> | 5173     | 42       | <b>4980</b> | 795      | 27       |
| <b>1000</b> | 000279   | -        | <b>2000</b> | 002786   | +4       | <b>3000</b> | 006432   | +19      | <b>4000</b> | 005087   | -44      | <b>5000</b> | 000743   | -25      |

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXI

Equation of Longitude

Argument I

| 1      | 2        | 3        | 1      | 2        | 3        | 1      | 2        | 3        |
|--------|----------|----------|--------|----------|----------|--------|----------|----------|
| I      | Equation | $\Delta$ | I      | Equation | $\Delta$ | I      | Equation | $\Delta$ |
| y      | °        |          | y      | °        |          | y      | °        |          |
| 1850°0 | 0°00532  | - 1      | 1900°0 | 0°00567  | + 2      | 1950°0 | 0°00641  | - 7      |
| 1°0    | 531      | - 1      | 1°0    | 569      | 2        | 1°0    | 635      | 6        |
| 2°0    | 530      | + 1      | 2°0    | 570      | 2        | 2°0    | 629      | 7        |
| 3°0    | 532      | 2        | 3°0    | 572      | 2        | 3°0    | 622      | 7        |
| 4°0    | 534      | 2        | 4°0    | 574      | 3        | 4°0    | 615      | 7        |
| 5°0    | 536      | 2        | 5°0    | 578      | 4        | 5°0    | 608      | 7        |
| 1856°0 | 0°00538  | + 2      | 1906°0 | 0°00581  | + 3      | 1956°0 | 0°00602  | - 7      |
| 7°0    | 539      | 2        | 7°0    | 584      | 4        | 7°0    | 595      | 7        |
| 8°0    | 541      | 2        | 8°0    | 588      | 4        | 8°0    | 589      | 7        |
| 9°0    | 543      | 3        | 9°0    | 592      | 4        | 9°0    | 582      | 6        |
| 1860°0 | 546      | 3        | 1910°0 | 596      | 5        | 1960°0 | 577      | 6        |
| 1861°0 | 0°00549  | + 3      | 1911°0 | 0°00601  | + 5      | 1961°0 | 0°00570  | - 6      |
| 2°0    | 551      | 2        | 2°0    | 606      | 5        | 2°0    | 565      | 5        |
| 3°0    | 553      | 3        | 3°0    | 610      | 5        | 3°0    | 560      | 5        |
| 4°0    | 556      | 3        | 4°0    | 616      | 7        | 4°0    | 555      | 5        |
| 5°0    | 559      | 3        | 5°0    | 623      | 6        | 5°0    | 550      | 5        |
| 1866°0 | 0°00562  | + 3      | 1916°0 | 0°00628  | + 6      | 1966°0 | 0°00545  | - 4      |
| 7°0    | 564      | 2        | 7°0    | 635      | 6        | 7°0    | 542      | 4        |
| 8°0    | 566      | 2        | 8°0    | 640      | 5        | 8°0    | 538      | 3        |
| 9°0    | 568      | 2        | 9°0    | 645      | 5        | 9°0    | 536      | 3        |
| 1870°0 | 570      | 2        | 1920°0 | 650      | 5        | 1970°0 | 532      | 3        |
| 1871°0 | 0°00572  | + 2      | 1921°0 | 0°00656  | + 6      | 1971°0 | 0°00530  | - 3      |
| 2°0    | 574      | 2        | 2°0    | 662      | 6        | 2°0    | 527      | 2        |
| 3°0    | 576      | 2        | 3°0    | 667      | 4        | 3°0    | 526      | 1        |
| 4°0    | 577      | + 1      | 4°0    | 670      | 4        | 4°0    | 526      | 1        |
| 5°0    | 577      | 0        | 5°0    | 675      | 5        | 5°0    | 524      | 1        |
| 1876°0 | 0°00577  | - 1      | 1926°0 | 0°00680  | + 5      | 1976°0 | 0°00524  | - 2      |
| 7°0    | 576      | 0        | 7°0    | 684      | 4        | 7°0    | 521      | 3        |
| 8°0    | 577      | + 1      | 8°0    | 688      | 4        | 8°0    | 519      | - 1      |
| 9°0    | 577      | 0        | 9°0    | 691      | 3        | 9°0    | 519      | 0        |
| 1880°0 | 577      | - 1      | 1930°0 | 694      | 3        | 1980°0 | 519      | + 1      |
| 1881°0 | 0°00576  | - 1      | 1931°0 | 0°00697  | + 2      | 1981°0 | 0°00520  | 0        |
| 2°0    | 576      | 1        | 2°0    | 698      | 1        | 2°0    | 519      | - 1      |
| 3°0    | 575      | 2        | 3°0    | 699      | + 1      | 3°0    | 518      | 0        |
| 4°0    | 573      | 1        | 4°0    | 699      | 0        | 4°0    | 519      | + 1      |
| 5°0    | 573      | 1        | 5°0    | 699      | - 1      | 5°0    | 520      | + 1      |
| 1886°0 | 0°00572  | - 1      | 1936°0 | 0°00698  | - 1      | 1986°0 | 0°00520  | - 1      |
| 7°0    | 571      | 1        | 7°0    | 697      | 1        | 7°0    | 519      | 1        |
| 8°0    | 571      | 1        | 8°0    | 696      | 2        | 8°0    | 518      | 1        |
| 9°0    | 570      | 2        | 9°0    | 694      | 3        | 9°0    | 518      | 1        |
| 1890°0 | 568      | 2        | 1940°0 | 691      | 3        | 1990°0 | 517      | 1        |
| 1891°0 | 0°00567  | - 1      | 1941°0 | 0°00688  | - 4      | 1991°0 | 0°00517  | - 1      |
| 2°0    | 566      | 1        | 2°0    | 684      | 5        | 2°0    | 516      | 1        |
| 3°0    | 565      | - 1      | 3°0    | 679      | 5        | 3°0    | 515      | 1        |
| 4°0    | 564      | 0        | 4°0    | 675      | 4        | 4°0    | 514      | 1        |
| 5°0    | 565      | + 1      | 5°0    | 672      | 4        | 5°0    | 512      | 2        |
| 1896°0 | 0°00565  | - 1      | 1946°0 | 0°00667  | - 6      | 1996°0 | 0°00510  | - 3      |
| 7°0    | 564      | + 1      | 7°0    | 660      | 7        | 7°0    | 507      | 3        |
| 8°0    | 566      | 1        | 8°0    | 654      | 6        | 8°0    | 505      | 3        |
| 9°0    | 566      | 1        | 9°0    | 648      | 7        | 9°0    | 502      | 4        |
| 1900°0 | 0°00567  | + 2      | 1950°0 | 0°00641  | - 7      | 2000°0 | 0°00498  | - 4      |

Applied Constant: +0°00700.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXII

Equation of Longitude

Argument J

| J    | Equation | $\Delta$<br>o d o | J    | Equation  | $\Delta$<br>o o | J    | Equation | $\Delta$<br>o o r | J     | Equation | $\Delta$<br>o o r |
|------|----------|-------------------|------|-----------|-----------------|------|----------|-------------------|-------|----------|-------------------|
| 0 00 | o 3300   | - 23 5            | 2 50 | o o o 333 | + 7             | 5 00 | o o 5120 | + 19 1            | 7 50  | o 515    | - 19 0            |
| 05   | 3182     | 3 5               | 55   | 371       | 8               | 05   | 5214     | 18 5              | 55    | 5 56     | 19 5              |
| 10   | 3 65     | 3 4               | 60   | 413       | 8 8             | 10   | 53 5     | 18 0              | 60    | 4957     | 19 9              |
| 15   | 948      | 3                 | 65   | 459       | 9 6             | 15   | 5394     | 17 4              | 65    | 4857     | 20 3              |
| 20   | 833      | 3                 | 70   | 5 9       | 4               | 20   | 5479     | 16 8              | 70    | 4754     | 20 7              |
| 25   | 716      | 3                 | 75   | 563       | 11 3            | 25   | 5562     | 16                | 75    | 4650     | 1 1               |
| 0 30 | 601      | - 8               | 2 80 | o o 6     | + 1 1           | 5 30 | o o 5641 | + 15 4            | 7 80  | o o 4543 | - 21 6            |
| 35   | 2488     | 2 6               | 85   | 684       | 1 8             | 35   | 5716     | 14 8              | 85    | 4434     | 21 9              |
| 40   | 2375     | 6                 | 90   | 75        | 13 4            | 40   | 5789     | 14                | 90    | 4324     | 2 1               |
| 45   | 6        |                   | 95   | 818       | 14 1            | 45   | 5858     | 13 4              | 95    | 4 13     | 2 4               |
| 50   | 153      | 17                | 3 00 | 891       | 15              | 50   | 5923     | 1 7               | 8 00  | 4100     | 22 7              |
| 0 55 | o 2045   | - 21 4            | 3 05 | o 968     | + 15 6          | 5 55 | o o 5985 | + 12 0            | 8 05  | o o 3986 | - 22 9            |
| 60   | 1939     | 1 1               | 10   | 1047      | 16 2            | 60   | 6043     | 11                | 10    | 3871     | 23 1              |
| 65   | 1834     | 0 7               | 15   | 113       | 16 9            | 65   | 6097     | 10 4              | 15    | 3755     | 3 3               |
| 70   | 1732     | 3                 | 20   | 1 16      | 17 5            | 70   | 6147     | 9 6               | 20    | 3638     | 23 4              |
| 75   | 1631     | 19 9              | 25   | 13 5      | 18 0            | 75   | 6193     | 8 8               | 25    | 35 1     | 3 3               |
| 0 80 | o o 1533 | - 19 3            | 3 30 | o 1396    | + 18 5          | 5 80 | o o 6235 | + 7 9             | 8 30  | o o 34 5 | - 3 4             |
| 85   | 1438     | 18 8              | 35   | 1490      | 19 1            | 85   | 627      | 7 1               | 35    | 3287     | 23 5              |
| 90   | 1345     | 18 3              | 40   | 1587      | 19 6            | 90   | 6306     | 6 3               | 40    | 3170     | 23 5              |
| 95   | 1 55     | 17 7              | 45   | 1686      | 0 1             | 95   | 6335     | 5 4               | 45    | 3052     | 23 5              |
| 1 00 | 1168     | 17 1              | 50   | 1788      | 20 5            | 6 00 | 6360     | 4 5               | 50    | 2935     | 23 3              |
| 1 05 | o o 1084 | - 16 5            | 3 55 | o o 1891  | + 0 9           | 6 05 | o o 6380 | + 3 5             | 8 55  | o o 2819 | - 23 2            |
| 10   | 1003     | 15 9              | 60   | 1997      | 1 3             | 10   | 6395     | 7                 | 60    | 703      | 23 0              |
| 15   | 9 5      | 15 3              | 65   | 21 4      | 21 7            | 15   | 6407     | 0                 | 65    | 589      | 22 8              |
| 20   | 850      | 14 6              | 70   | 2214      | 2 1             | 20   | 6415     | 1 1               | 70    | 2475     | 22 7              |
| 25   | 779      | 13 8              | 75   | 23 5      | 3               | 25   | 6418     | + 0 2             | 75    | 2362     | 2 4               |
| 1 30 | o o 71   | - 13 1            | 3 80 | o o 2437  | + 22 5          | 6 30 | o 6417   | - 0 7             | 8 80  | o o 2251 | - 22 1            |
| 35   | 648      | 1 3               | 85   | 255       | 2 8             | 35   | 6411     | 1 6               | 85    | 2141     | 1 8               |
| 40   | 589      | 11 6              | 90   | 665       | 3 0             | 40   | 64 1     | 2 5               | 90    | 2033     | 1 4               |
| 45   | 53       | 10 9              | 95   | 780       | 3               | 45   | 6386     | 3 4               | 95    | 1927     | 21 0              |
| 50   | 480      | 9 9               | 4 00 | 2897      | 3 4             | 50   | 6367     | 4                 | 9 00  | 1823     | 20 7              |
| 1 55 | o o 433  | - 9 1             | 4 05 | o o 3014  | + 23 3          | 6 55 | o o 6344 | - 5 1             | 9 05  | o o 1720 | - 20 3            |
| 60   | 389      | 8 4               | 10   | 3130      | 23 4            | 60   | 6316     | 6 1               | 10    | 16 0     | 19 7              |
| 65   | 349      | 7 6               | 15   | 3 48      | 3 6             | 65   | 6 83     | 6 9               | 15    | 1523     | 19 2              |
| 70   | 313      | 6 8               | 20   | 3366      | 3 5             | 70   | 6247     | 7 6               | 20    | 14 8     | 18 8              |
| 75   | 81       | 5 9               | 25   | 3483      | 3 4             | 75   | 6 07     | 8 4               | 25    | 1335     | 18 3              |
| 1 80 | o o 54   | - 5 0             | 4 30 | o 3600    | + 23 2          | 6 80 | o o 6163 | - 9 3             | 9 30  | o o 1245 | - 17 7            |
| 85   | 31       | 4 1               | 35   | 3716      | 3               | 85   | 6114     | 10 2              | 35    | 1158     | 17 0              |
| 90   | 13       | 3 1               | 40   | 3832      | 3               | 90   | 6061     | 1 9               | 40    | 1075     | 16 3              |
| 95   | 200      | 2 5               | 45   | 3948      | 23 0            | 95   | 6005     | 11 7              | 45    | 995      | 15 8              |
| 2 00 | 188      | 1 7               | 50   | 4 6       | 2 8             | 7 00 | 5944     | 12 5              | 50    | 917      | 15 3              |
| 2 05 | o o 183  | - 0 6             | 4 55 | o o 4176  | + 22 5          | 7 05 | o o 5880 | - 13              | 9 55  | o o 842  | - 14 6            |
| 10   | 18       | + 0               | 60   | 4287      | 22 2            | 10   | 5812     | 13 8              | 60    | 771      | 13 8              |
| 15   | 185      | 1                 | 65   | 4398      | 22 0            | 15   | 5742     | 14 5              | 65    | 704      | 13 0              |
| 20   | 193      | 2 1               | 70   | 4507      | 21 7            | 20   | 5667     | 15 4              | 70    | 641      | 12 3              |
| 25   | 6        | 9                 | 75   | 4615      | 21 3            | 25   | 5588     | 16 0              | 75    | 581      | 11 5              |
| 2 30 | o o 222  | + 3 7             | 4 80 | o o 4720  | + 20 9          | 7 30 | o o 5507 | - 16 5            | 9 80  | o o 526  | - 10 7            |
| 35   | 243      | 4 7               | 85   | 48 4      | 2 5             | 35   | 5423     | 17 1              | 85    | 474      | 9 9               |
| 40   | 269      | 5 6               | 90   | 49 5      | 19 9            | 40   | 5336     | 17 7              | 90    | 4 7      | 9 0               |
| 45   | 99       | 6 4               | 95   | 5023      | 19 5            | 45   | 5246     | 18 4              | 95    | 384      | 8                 |
| 2 50 | o o 333  | + 7               | 5 00 | o o 5120  | + 19 1          | 7 50 | o o 5152 | - 19 0            | 10 00 | o o 345  | - 7 5             |



# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXII continued

Equation of Longitude

Argument J

| 1                | 2                   | 3   | 1                | 2                   | 3   | 1                | 2                   | 3   | 1                | 2                   | 3   |
|------------------|---------------------|---|------------------|---------------------|---|------------------|---------------------|---|------------------|---------------------|---|
| J                | Equation            | $\Delta$<br>0 <sup>d</sup> 0 <sup>r</sup> | J                | Equation            | $\Delta$<br>0 <sup>d</sup> 0 <sup>r</sup> | J                | Equation            | $\Delta$<br>0 <sup>d</sup> 0 <sup>r</sup> | J                | Equation            | $\Delta$<br>0 <sup>d</sup> 0 <sup>r</sup> |
| d                | o                   |   | d                | o                   |   | d                | o                   |   | d                | o                   |   |
| 10 <sup>00</sup> | 0 <sup>00</sup> 345 | - 7,5                                     | 12 <sup>50</sup> | 0 <sup>03</sup> 261 | + 23,6                                    | 15 <sup>00</sup> | 0 <sup>06</sup> 280 | - 7,0                                     | 17 <sup>50</sup> | 0 <sup>01</sup> 511 | - 19,1                                    |
| 05               | 309                 | 6,7                                       | 55               | 3379                | 23,5                                      | 05               | 6243                | 7,7                                       | 55               | 1417                | 18,6                                      |
| 10               | 278                 | 5,8                                       | 60               | 3496                | 23,5                                      | 10               | 6203                | 8,5                                       | 60               | 1325                | 18,2                                      |
| 15               | 251                 | 4,9                                       | 65               | 3614                | 23,4                                      | 15               | 6158                | 9,4                                       | 65               | 1235                | 17,5                                      |
| 20               | 229                 | 4,0                                       | 70               | 3730                | 23,2                                      | 20               | 6109                | 10,2                                      | 70               | 1150                | 16,7                                      |
| 25               | 211                 | 3,3                                       | 75               | 3846                | 23,0                                      | 25               | 6056                | 11,1                                      | 75               | 1068                | 16,3                                      |
| 10 <sup>30</sup> | 0 <sup>00</sup> 196 | - 2,4                                     | 12 <sup>80</sup> | 0 <sup>03</sup> 960 | + 22,8                                    | 15 <sup>30</sup> | 0 <sup>05</sup> 998 | - 11,8                                    | 17 <sup>80</sup> | 0 <sup>00</sup> 987 | - 15,9                                    |
| 35               | 187                 | 1,4                                       | 85               | 4074                | 22,8                                      | 35               | 5938                | 12,5                                      | 85               | 909                 | 15,3                                      |
| 40               | 182                 | - 0,5                                     | 90               | 4188                | 22,6                                      | 40               | 5873                | 13,2                                      | 90               | 834                 | 14,6                                      |
| 45               | 182                 | + 0,4                                     | 95               | 4300                | 22,2                                      | 45               | 5806                | 13,9                                      | 95               | 763                 | 13,6                                      |
| 50               | 186                 | 1,3                                       | 13 <sup>00</sup> | 4410                | 21,9                                      | 50               | 5734                | 14,7                                      | 18 <sup>00</sup> | 698                 | 12,8                                      |
| 10 <sup>55</sup> | 0 <sup>00</sup> 195 | + 2,1                                     | 13 <sup>05</sup> | 0 <sup>04</sup> 519 | + 21,6                                    | 15 <sup>55</sup> | 0 <sup>05</sup> 659 | - 15,4                                    | 18 <sup>05</sup> | 0 <sup>00</sup> 635 | - 12,1                                    |
| 60               | 207                 | 2,9                                       | 10               | 4626                | 21,2                                      | 60               | 5580                | 16,1                                      | 10               | 577                 | 11,5                                      |
| 65               | 224                 | 4,0                                       | 15               | 4731                | 20,8                                      | 65               | 5498                | 16,6                                      | 15               | 520                 | 10,9                                      |
| 70               | 247                 | 4,9                                       | 20               | 4834                | 20,5                                      | 70               | 5414                | 17,1                                      | 20               | 468                 | 9,9                                       |
| 75               | 273                 | 5,7                                       | 25               | 4936                | 20,0                                      | 75               | 5327                | 17,9                                      | 25               | 421                 | 8,9                                       |
| 10 <sup>80</sup> | 0 <sup>00</sup> 304 | + 6,5                                     | 13 <sup>30</sup> | 0 <sup>05</sup> 034 | + 19,5                                    | 15 <sup>80</sup> | 0 <sup>05</sup> 235 | - 18,5                                    | 18 <sup>30</sup> | 0 <sup>00</sup> 379 | - 8,0                                     |
| 85               | 338                 | 7,1                                       | 35               | 5131                | 19,0                                      | 85               | 5142                | 18,9                                      | 35               | 341                 | 7,3                                       |
| 90               | 375                 | 8,0                                       | 40               | 5224                | 18,4                                      | 90               | 5046                | 19,4                                      | 40               | 306                 | 6,5                                       |
| 95               | 418                 | 8,9                                       | 45               | 5315                | 18,0                                      | 95               | 4948                | 20,0                                      | 45               | 276                 | 5,8                                       |
| 11 <sup>00</sup> | 464                 | 9,6                                       | 50               | 5404                | 17,4                                      | 16 <sup>00</sup> | 4846                | 20,4                                      | 50               | 248                 | 5,0                                       |
| 11 <sup>05</sup> | 0 <sup>00</sup> 514 | + 10,5                                    | 13 <sup>55</sup> | 0 <sup>05</sup> 489 | + 16,7                                    | 16 <sup>05</sup> | 0 <sup>04</sup> 744 | - 20,7                                    | 18 <sup>55</sup> | 0 <sup>00</sup> 226 | - 4,1                                     |
| 10               | 569                 | 11,3                                      | 60               | 5571                | 16,0                                      | 10               | 4639                | 21,2                                      | 60               | 209                 | 3,0                                       |
| 15               | 627                 | 12,2                                      | 65               | 5649                | 15,3                                      | 15               | 4532                | 21,7                                      | 65               | 196                 | 2,2                                       |
| 20               | 691                 | 12,9                                      | 70               | 5724                | 14,7                                      | 20               | 4422                | 22,0                                      | 70               | 187                 | 1,4                                       |
| 25               | 756                 | 13,4                                      | 75               | 5796                | 14,0                                      | 25               | 4312                | 22,2                                      | 75               | 182                 | - 0,5                                     |
| 11 <sup>30</sup> | 0 <sup>00</sup> 825 | + 14,3                                    | 13 <sup>80</sup> | 0 <sup>05</sup> 864 | + 13,4                                    | 16 <sup>30</sup> | 0 <sup>04</sup> 200 | - 22,5                                    | 18 <sup>80</sup> | 0 <sup>00</sup> 182 | + 0,4                                     |
| 35               | 899                 | 15,1                                      | 85               | 5930                | 12,7                                      | 35               | 4087                | 22,7                                      | 85               | 186                 | 1,3                                       |
| 40               | 976                 | 15,6                                      | 90               | 5991                | 11,9                                      | 40               | 3973                | 22,8                                      | 90               | 195                 | 2,3                                       |
| 45               | 1055                | 16,3                                      | 95               | 6049                | 11,1                                      | 45               | 3859                | 23,0                                      | 95               | 209                 | 3,1                                       |
| 50               | 1139                | 17,0                                      | 14 <sup>00</sup> | 6102                | 10,3                                      | 50               | 3743                | 23,4                                      | 19 <sup>00</sup> | 226                 | 4,0                                       |
| 11 <sup>55</sup> | 0 <sup>01</sup> 225 | + 17,6                                    | 14 <sup>05</sup> | 0 <sup>06</sup> 152 | + 9,5                                     | 16 <sup>55</sup> | 0 <sup>03</sup> 625 | - 23,5                                    | 19 <sup>05</sup> | 0 <sup>00</sup> 249 | + 4,9                                     |
| 60               | 1315                | 18,1                                      | 10               | 6197                | 8,7                                       | 60               | 3508                | 23,4                                      | 10               | 275                 | 5,7                                       |
| 65               | 1406                | 18,5                                      | 15               | 6239                | 7,9                                       | 65               | 3391                | 23,5                                      | 15               | 306                 | 6,4                                       |
| 70               | 1500                | 19,1                                      | 20               | 6276                | 7,0                                       | 70               | 3273                | 23,6                                      | 20               | 339                 | 7,3                                       |
| 75               | 1597                | 19,7                                      | 25               | 6309                | 6,2                                       | 75               | 3155                | 23,4                                      | 25               | 379                 | 8,4                                       |
| 11 <sup>80</sup> | 0 <sup>01</sup> 697 | + 20,2                                    | 14 <sup>30</sup> | 0 <sup>06</sup> 338 | + 5,3                                     | 16 <sup>80</sup> | 0 <sup>03</sup> 039 | - 23,3                                    | 19 <sup>30</sup> | 0 <sup>00</sup> 423 | + 9,0                                     |
| 85               | 1799                | 20,6                                      | 35               | 6362                | 4,4                                       | 85               | 2922                | 23,3                                      | 35               | 469                 | 9,6                                       |
| 90               | 1903                | 20,9                                      | 40               | 6382                | 3,5                                       | 90               | 2806                | 23,1                                      | 40               | 519                 | 10,5                                      |
| 95               | 2008                | 21,3                                      | 45               | 6397                | 2,6                                       | 95               | 2691                | 22,9                                      | 45               | 574                 | 11,5                                      |
| 12 <sup>00</sup> | 2116                | 21,8                                      | 50               | 6408                | 1,9                                       | 17 <sup>00</sup> | 2577                | 22,8                                      | 50               | 634                 | 12,4                                      |
| 12 <sup>05</sup> | 0 <sup>02</sup> 226 | + 22,2                                    | 14 <sup>55</sup> | 0 <sup>06</sup> 416 | + 1,0                                     | 17 <sup>05</sup> | 0 <sup>02</sup> 463 | - 22,7                                    | 19 <sup>55</sup> | 0 <sup>00</sup> 698 | + 13,0                                    |
| 10               | 2338                | 22,4                                      | 60               | 6418                | + 0,1                                     | 10               | 2350                | 22,5                                      | 60               | 764                 | 13,7                                      |
| 15               | 2450                | 22,5                                      | 65               | 6417                | - 0,8                                     | 15               | 2238                | 22,1                                      | 65               | 833                 | 14,3                                      |
| 20               | 2563                | 22,7                                      | 70               | 6410                | 1,7                                       | 20               | 2129                | 21,7                                      | 70               | 907                 | 15,2                                      |
| 25               | 2677                | 22,9                                      | 75               | 6400                | 2,6                                       | 25               | 2021                | 21,3                                      | 75               | 985                 | 15,8                                      |
| 12 <sup>30</sup> | 0 <sup>02</sup> 792 | + 23,2                                    | 14 <sup>80</sup> | 0 <sup>06</sup> 384 | - 3,5                                     | 17 <sup>30</sup> | 0 <sup>01</sup> 916 | - 21,0                                    | 19 <sup>80</sup> | 0 <sup>01</sup> 065 | + 16,4                                    |
| 35               | 2909                | 23,4                                      | 85               | 6365                | 4,4                                       | 35               | 1811                | 20,7                                      | 85               | 1149                | 17,0                                      |
| 40               | 3026                | 23,4                                      | 90               | 6340                | 5,2                                       | 40               | 1709                | 20,3                                      | 90               | 1235                | 17,5                                      |
| 45               | 3143                | 23,5                                      | 95               | 6313                | 6,0                                       | 45               | 1608                | 19,8                                      | 95               | 1324                | 18,2                                      |
| 12 <sup>50</sup> | 0 <sup>03</sup> 261 | + 23,6                                    | 15 <sup>00</sup> | 0 <sup>06</sup> 280 | - 7,0                                     | 17 <sup>50</sup> | 0 <sup>01</sup> 511 | - 19,1                                    | 20 <sup>00</sup> | 0 <sup>01</sup> 417 | + 18,8                                    |

Applied Constant : +0<sup>h</sup>03<sup>m</sup>00<sup>s</sup>.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Longitude

XXIII

| K  | Equation | $\Delta$ | K   | Equation | $\Delta$ |
|----|----------|----------|-----|----------|----------|
| a  | 0007 0   | - 48     | a   | 1074     | + 39     |
| 1  | 65       | 48       | 1   | 111      | 37       |
| 2  | 6 3      | 48       | 2   | 1148     | 35       |
| 3  | 556      | 47       | 3   | 1181     | 3        |
| 4  | 509      | 46       | 4   | 1 1      | 9        |
| 5  | 464      | 45       | 5   | 1 39     | 6        |
| 06 | 0 04 0   | - 44     | 56  | 001 64   | + 24     |
| 7  | 377      | 4        | 7   | 1 86     | 20       |
| 8  | 336      | 4        | 8   | 1304     | 16       |
| 9  | 98       | 37       | 9   | 1318     | 13       |
| 10 | 6        | 35       | 60  | 13 9     | 9        |
| 11 | 0 00 8   | - 33     | 61  | 001336   | + 6      |
| 2  | 196      | 30       | 2   | 1340     | + 3      |
| 3  | 68       | 27       | 3   | 1341     | - 1      |
| 4  | 14       | 4        | 4   | 1338     | 5        |
| 5  | 120      | 21       | 5   | 1331     | 9        |
| 16 | 0 00101  | 17       | 66  | 00132    | - 13     |
| 7  | 86       | 14       | 7   | 1306     | 16       |
| 8  | 74       | 11       | 8   | 1 88     | 19       |
| 9  | 65       | 7        | 9   | 1 68     | 22       |
| 20 | 6        | - 3      | 70  | 1 44     | 6        |
| 21 | 0 00059  | + 1      | 71  | 001217   | - 29     |
| 2  | 6        | 5        | 2   | 1186     | 3        |
| 3  | 68       | 8        | 3   | 1153     | 34       |
| 4  | 77       | 11       | 4   | 1118     | 36       |
| 5  | 90       | 15       | 5   | 1 81     | 39       |
| 26 | 0 00106  | + 18     | 76  | 001041   | - 41     |
| 7  | 126      |          | 7   | 999      | 43       |
| 8  | 149      | 5        | 8   | 956      | 44       |
| 9  | 175      | 28       | 9   | 911      | 46       |
| 30 | 05       | 31       | 80  | 864      | 47       |
| 31 | 00 37    | + 33     | 81  | 000817   | - 47     |
| 2  | 71       | 36       | 2   | 770      | 48       |
| 3  | 308      | 39       | 3   | 7 2      | 49       |
| 4  | 348      | 41       | 4   | 673      | 49       |
| 5  | 389      | 4        | 5   | 6 5      | 48       |
| 36 | 0 00432  | + 44     | 86  | 000577   | - 48     |
| 7  | 476      | 45       | 7   | 530      | 47       |
| 8  | 522      | 47       | 8   | 484      | 46       |
| 9  | 569      | 48       | 9   | 439      | 44       |
| 40 | 6 7      | 48       | 90  | 396      | 43       |
| 41 | 00665    | + 48     | 91  | 000355   | 41       |
| 2  | 713      | 49       | 2   | 315      | 39       |
| 3  | 76       | 49       | 3   | 77       | 37       |
| 4  | 810      | 48       | 4   | 4        | 34       |
| 5  | 857      | 47       | 5   | 210      | 31       |
| 46 | 0 00903  | + 46     | 96  | 000180   | - 9      |
| 7  | 948      | 45       | 7   | 153      | 6        |
| 8  | 99       | 43       | 8   | 129      | 2        |
| 9  | 1 34     | 41       | 9   | 109      | 19       |
| 50 | 0 01074  | + 39     | 100 | 0 009    | - 15     |

Appl d C t t +  $\infty \infty$

XXIV

| L   | Equation | $\Delta$ |
|-----|----------|----------|
| 00  | 00100    | + 5      |
| 2   | 110      | 5        |
| 4   | 1 0      | 5        |
| 6   | 13       | 5        |
| 8   | 139      | 4        |
| 10  | 147      | 4        |
| 12  | 00 154   | + 3      |
| 4   | 160      | 3        |
| 6   | 164      |          |
| 8   | 167      | + 1      |
| 20  | 168      |          |
| 22  | 000168   | - 1      |
| 4   | 166      | 1        |
| 6   | 163      |          |
| 8   | 159      | 3        |
| 30  | 53       | 3        |
| 32  | 000146   | - 4      |
| 4   | 138      | 5        |
| 6   | 128      | 5        |
| 8   | 119      | 5        |
| 40  | 1 9      | 5        |
| 42  | 0 00098  | - 5      |
| 4   | 88       | 5        |
| 6   | 78       | 5        |
| 8   | 69       | 5        |
| 50  | 60       | 4        |
| 52  | 0 0005   | - 4      |
| 4   | 45       | 3        |
| 6   | 39       | 3        |
| 8   | 35       | 2        |
| 60  | 33       | - 1      |
| 62  | 0 0003   | 0        |
| 4   | 32       | + 1      |
| 6   | 34       | 1        |
| 8   | 37       |          |
| 70  | 4        | 3        |
| 72  | 0 00048  | + 3      |
| 4   | 55       | 4        |
| 6   | 64       | 5        |
| 8   | 73       | 5        |
| 80  | 83       | 5        |
| 82  | 0 00093  | + 5      |
| 4   | 103      | 5        |
| 6   | 113      | 5        |
| 8   | 1 3      | 5        |
| 90  | 133      | 5        |
| 92  | 0 00141  | + 4      |
| 4   | 149      | 4        |
| 6   | 156      | 3        |
| 8   | 161      | 2        |
| 100 | 0 00165  | + 2      |

C ta +  $\infty \infty$

XXV

| M   | Equation | $\Delta$ | M   | Equation | $\Delta$ |
|-----|----------|----------|-----|----------|----------|
| 00  | 0 00050  | 3        | 100 | 0 00022  | 1        |
| 2   | 45       | 2        | 2   | 0        | - 1      |
| 4   | 41       |          | 4   | 2        | 0        |
| 6   | 37       |          | 6   | 0        | 0        |
| 8   | 33       |          | 8   | 21       | + 1      |
| 10  | 29       |          | 110 | 3        | 1        |
| 12  | 0 00 6   | - 1      | 112 | 0 000 5  | + 1      |
| 4   | 4        | 1        | 4   | 28       | 2        |
| 6   | 2        | 1        | 6   | 31       | 2        |
| 8   | 1        | - 1      | 8   | 35       |          |
| 20  | 20       | 0        | 120 | 39       | 2        |
| 22  | 0 0 0 0  | 0        | 122 | 00043    | + 2      |
| 4   | 21       | + 1      | 4   | 47       | 2        |
| 6   | 2        | 1        | 6   | 51       | 2        |
| 8   | 4        | 1        | 8   | 56       | 3        |
| 30  | 27       | 2        | 130 | 61       |          |
| 32  | 0 00030  | + 2      | 132 | 0 00065  | + 2      |
| 4   | 33       | 2        | 4   | 69       |          |
| 6   | 37       |          | 6   | 72       |          |
| 8   | 4        |          | 8   | 75       | 1        |
| 40  | 46       | 2        | 140 | 77       | 1        |
| 42  | 0 00051  | + 2      | 142 | 0 00079  | + 1      |
| 4   | 55       |          | 4   | 8        | 0        |
| 6   | 60       | 2        | 6   | 80       | 0        |
| 8   | 64       | 2        | 8   | 80       | 0        |
| 50  | 68       |          | 150 | 79       | - 1      |
| 52  | 0 00 71  | + 2      | 152 | 0 00077  | - 1      |
| 4   | 74       | 1        | 4   | 75       | 1        |
| 6   | 76       | 1        | 6   | 72       | 2        |
| 8   | 78       | 1        | 8   | 69       | 2        |
| 60  | 79       | + 1      | 160 | 65       | 2        |
| 62  | 0 00080  | 0        | 162 | 0 00061  | - 2      |
| 4   | 80       | 0        | 4   | 56       |          |
| 6   | 79       | - 1      | 6   | 52       | 2        |
| 8   | 77       | 1        | 8   | 47       | 2        |
| 70  | 75       | 1        | 170 | 43       | 2        |
| 72  | 0 00073  | - 1      | 172 | 0 00039  | -        |
| 4   | 70       | 2        | 4   | 35       |          |
| 6   | 66       |          | 6   | 31       | 2        |
| 8   | 6        | 2        | 8   | 28       | 2        |
| 80  | 58       |          | 180 | 25       | 1        |
| 82  | 00 53    | -        | 182 | 0 00023  | - 1      |
| 4   | 49       |          | 4   | 21       | - 1      |
| 6   | 44       | 2        | 6   | 20       | 0        |
| 8   | 40       | 2        | 8   | 0        |          |
| 90  | 36       | 2        | 190 | 0        | 0        |
| 92  | 0 0003   |          | 192 | 0 00021  | + 1      |
| 4   | 29       |          | 4   | 23       | 1        |
| 6   | 6        | 1        | 6   | 6        | 2        |
| 8   | 4        | 1        | 8   | 29       | 2        |
| 100 | 0 0002   | - 1      | 200 | 0 00032  |          |

Appl d Co tant +  $\infty \infty$

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXVI      Equation of Variation of the Radius Vector, Doubled.      Argument E

| 1        | 2         | 3    | 1        | 2         | 3    | 1         | 2         | 3    | 1         | 2         | 3    |
|----------|-----------|------|----------|-----------|------|-----------|-----------|------|-----------|-----------|------|
| E        | Equation  | Δ    | E        | Equation  | Δ    | E         | Equation  | Δ    | E         | Equation  | Δ    |
| d<br>0.0 | - 0.01580 | + 0  | d<br>5.0 | + 0.00355 | + 53 | d<br>10.0 | + 0.01096 | - 32 | d<br>15.0 | - 0.01287 | - 34 |
| .1       | 1579      | 2    | .1       | 407       | 52   | .1        | 1063      | 34   | .1        | 1320      | 32   |
| .2       | 1576      | 5    | .2       | 459       | 51   | .2        | 1029      | 35   | .2        | 1351      | 30   |
| .3       | 1570      | 7    | .3       | 509       | 50   | .3        | 993       | 37   | .3        | 1380      | 28   |
| .4       | 1563      | 8    | .4       | 559       | 50   | .4        | 956       | 39   | .4        | 1407      | 26   |
| .5       | 1554      | 11   | .5       | 608       | 49   | .5        | 917       | 40   | .5        | 1432      | 24   |
| 0.6      | - 0.01542 | + 13 | 5.6      | + 0.00657 | + 48 | 10.6      | + 0.00876 | - 41 | 15.6      | - 0.01455 | - 23 |
| .7       | 1528      | 15   | .7       | 704       | 47   | .7        | 835       | 43   | .7        | 1477      | 21   |
| .8       | 1512      | 17   | .8       | 750       | 45   | .8        | 791       | 45   | .8        | 1497      | 19   |
| .9       | 1495      | 18   | .9       | 794       | 44   | .9        | 746       | 45   | .9        | 1514      | 16   |
| 1.0      | 1476      | 21   | 6.0      | 837       | 43   | 11.0      | 701       | 46   | 16.0      | 1529      | 14   |
| 1.1      | - 0.01454 | + 23 | 6.1      | + 0.00879 | + 41 | 11.1      | + 0.00654 | - 48 | 16.1      | - 0.01542 | - 13 |
| .2       | 1430      | 24   | .2       | 919       | 40   | .2        | 605       | 49   | .2        | 1554      | 11   |
| .3       | 1405      | 27   | .3       | 958       | 38   | .3        | 556       | 50   | .3        | 1564      | 9    |
| .4       | 1377      | 29   | .4       | 995       | 37   | .4        | 506       | 51   | .4        | 1571      | 6    |
| .5       | 1348      | 30   | .5       | 1031      | 36   | .5        | 455       | 51   | .5        | 1576      | 4    |
| 1.6      | - 0.01317 | + 32 | 6.6      | + 0.01066 | + 34 | 11.6      | + 0.00404 | - 52 | 16.6      | - 0.01579 | - 2  |
| .7       | 1284      | 34   | .7       | 1098      | 32   | .7        | 351       | 53   | .7        | 1580      | 0    |
| .8       | 1250      | 35   | .8       | 1129      | 31   | .8        | 298       | 53   | .8        | 1579      | + 2  |
| .9       | 1214      | 37   | .9       | 1159      | 29   | .9        | 245       | 53   | .9        | 1576      | 4    |
| 2.0      | 1176      | 39   | 7.0      | 1187      | 27   | 12.0      | 192       | 54   | 17.0      | 1571      | 6    |
| 2.1      | - 0.01137 | + 40 | 7.1      | + 0.01213 | + 25 | 12.1      | + 0.00137 | - 55 | 17.1      | - 0.01564 | + 9  |
| .2       | 1097      | 41   | .2       | 1237      | 23   | .2        | 82        | 55   | .2        | 1554      | 12   |
| .3       | 1055      | 43   | .3       | 1259      | 22   | .3        | + 27      | 56   | .3        | 1541      | 14   |
| .4       | 1012      | 44   | .4       | 1280      | 19   | .4        | - 29      | 56   | .4        | 1526      | 16   |
| .5       | 968       | 45   | .5       | 1297      | 17   | .5        | 85        | 56   | .5        | 1510      | 17   |
| 2.6      | - 0.00922 | + 47 | 7.6      | + 0.01313 | + 16 | 12.6      | - 0.00141 | - 56 | 17.6      | - 0.01492 | + 19 |
| .7       | 875       | 48   | .7       | 1328      | 14   | .7        | 196       | 55   | .7        | 1472      | 21   |
| .8       | 826       | 49   | .8       | 1340      | 11   | .8        | 251       | 55   | .8        | 1450      | 23   |
| .9       | 777       | 50   | .9       | 1350      | 9    | .9        | 306       | 55   | .9        | 1426      | 25   |
| 3.0      | 727       | 51   | 8.0      | 1357      | 7    | 13.0      | 361       | 55   | 18.0      | 1401      | 26   |
| 3.1      | - 0.00676 | + 52 | 8.1      | + 0.01363 | + 5  | 13.1      | - 0.00416 | - 55 | 18.1      | - 0.01374 | + 28 |
| .2       | 624       | 52   | .2       | 1367      | 3    | .2        | 470       | 54   | .2        | 1345      | 30   |
| .3       | 572       | 53   | .3       | 1369      | + 1  | .3        | 523       | 53   | .3        | 1314      | 32   |
| .4       | 519       | 54   | .4       | 1370      | - 1  | .4        | 576       | 53   | .4        | 1282      | 34   |
| .5       | 465       | 54   | .5       | 1368      | 3    | .5        | 628       | 52   | .5        | 1247      | 36   |
| 3.6      | - 0.00411 | + 54 | 8.6      | + 0.01364 | - 5  | 13.6      | - 0.00680 | - 51 | 18.6      | - 0.01211 | + 37 |
| .7       | 357       | 55   | .7       | 1358      | 7    | .7        | 730       | 50   | .7        | 1174      | 38   |
| .8       | 302       | 55   | .8       | 1350      | 9    | .8        | 780       | 50   | .8        | 1135      | 40   |
| .9       | 247       | 55   | .9       | 1340      | 12   | .9        | 830       | 49   | .9        | 1094      | 42   |
| 4.0      | 192       | 56   | 9.0      | 1327      | 14   | 14.0      | 878       | 48   | 19.0      | 1051      | 43   |
| 4.1      | - 0.00136 | + 56 | 9.1      | + 0.01312 | - 16 | 14.1      | - 0.00925 | - 46 | 19.1      | - 0.01008 | + 44 |
| .2       | 80        | 56   | .2       | 1295      | 18   | .2        | 970       | 45   | .2        | 963       | 45   |
| .3       | - 25      | 55   | .3       | 1276      | 19   | .3        | 1015      | 44   | .3        | 918       | 46   |
| .4       | + 30      | 55   | .4       | 1256      | 21   | .4        | 1058      | 42   | .4        | 871       | 48   |
| .5       | 85        | 55   | .5       | 1234      | 23   | .5        | 1099      | 41   | .5        | 822       | 50   |
| 4.6      | + 0.00140 | + 55 | 9.6      | + 0.01210 | - 25 | 14.6      | - 0.01140 | - 40 | 19.6      | - 0.00772 | + 50 |
| .7       | 195       | 54   | .7       | 1184      | 27   | .7        | 1179      | 39   | .7        | 722       | 51   |
| .8       | 248       | 54   | .8       | 1156      | 29   | .8        | 1217      | 37   | .8        | 671       | 52   |
| .9       | 302       | 54   | .9       | 1127      | 30   | .9        | 1253      | 35   | .9        | 619       | 52   |
| 5.0      | + 0.00355 | + 53 | 10.0     | + 0.01096 | - 32 | 15.0      | - 0.01287 | - 34 | 20.0      | - 0.00567 | + 52 |

Applied Constant: - .00200.

The Equation of this Table must be supplemented by those of Tables XXVII-XXIX.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

Equations of the Variation of Radius Vector, Doubled

XXVII

XXVIII

XXIX

| C   | Equation | C   | Equatio |
|-----|----------|-----|---------|
| d   |          |     |         |
| 00  | 0 00 64  | 100 | 0 00043 |
| 2   | 64       | 2   | 45      |
| 4   | 63       | 4   | 48      |
| 6   | 62       | 6   | 5       |
| 8   | 61       | 8   | 5       |
| 10  | 6        | 110 | 55      |
| 12  | 0 00 58  | 112 | 0 00057 |
| 4   | 56       | 4   | 59      |
| 6   | 54       | 6   | 60      |
| 8   | 52       | 8   | 62      |
| 20  | 49       | 120 | 63      |
| 22  | 0 00047  | 122 | 0 00064 |
| 4   | 44       | 4   | 64      |
| 6   | 4        | 6   | 64      |
| 8   | 39       | 8   | 64      |
| 30  | 37       | 130 | 63      |
| 32  | 0 00035  | 132 | 0 00062 |
| 4   | 33       | 4   | 61      |
| 6   | 3        | 6   | 59      |
| 8   | 30       | 8   | 57      |
| 40  | 29       | 140 | 55      |
| 42  | 0 000 8  | 142 | 0 00053 |
| 4   | 27       | 4   | 51      |
| 6   | 26       | 6   | 48      |
| 8   | 5        | 8   | 46      |
| 50  | 25       | 150 | 43      |
| 52  | 0 00025  | 152 | 0 00041 |
| 4   | 4        | 4   | 39      |
| 6   | 24       | 6   | 37      |
| 8   | 24       | 8   | 35      |
| 60  | 4        | 160 | 33      |
| 62  | 0 000 4  | 162 | 0 00031 |
| 4   | 24       | 4   | 30      |
| 6   | 4        | 6   | 8       |
| 8   | 24       | 8   | 27      |
| 70  | 24       | 170 | 27      |
| 72  | 0 00024  | 172 | 0 00026 |
| 4   | 5        | 4   | 25      |
| 6   | 25       | 6   | 25      |
| 8   | 26       | 8   | 25      |
| 80  | 6        | 180 | 24      |
| 82  | 0 00 27  | 182 | 0 000 4 |
| 4   | 28       | 4   | 24      |
| 6   | 29       | 6   | 4       |
| 8   | 31       | 8   | 4       |
| 90  | 3        | 190 | 4       |
| 92  | 0 00034  | 192 | 0 00024 |
| 4   | 36       | 4   | 24      |
| 6   | 38       | 6   | 4       |
| 8   | 40       | 8   | 25      |
| 100 | 0 00043  | 200 | 0 00 25 |

0 t t + 000

| D   | Equation | 3<br>0 1 |
|-----|----------|----------|
| 00  | 0 00076  | - 0 0    |
| 04  | 76       | 0 3      |
| 08  | 74       | 0 5      |
| 12  | 7        | 0 5      |
| 16  | 70       | 0 8      |
| 20  | 66       | 0 8      |
| 24  | 0 00062  | - 1 0    |
| 28  | 58       | 1 1      |
| 32  | 53       | 1 3      |
| 36  | 48       | 1 4      |
| 40  | 42       | 1 4      |
| 44  | 0 00037  | - 1 3    |
| 48  | 3        | 1 3      |
| 52  | 27       | 1 3      |
| 56  | 22       | 1 3      |
| 60  | 17       | 1 1      |
| 64  | 0 00013  | - 0 9    |
| 68  | 10       | 0 8      |
| 72  | 7        | 0 6      |
| 76  | 5        | 0 4      |
| 80  | 4        | - 0 1    |
| 84  | 0 00004  | + 0 1    |
| 88  | 5        | 0 3      |
| 92  | 6        | 0 4      |
| 96  | 8        | 0 5      |
| 100 | 11       | 0 8      |
| 104 | 0 00014  | + 0 9    |
| 108 | 18       | 1 1      |
| 112 | 23       | 1 3      |
| 116 | 28       | 1 3      |
| 120 | 33       | 1 3      |
| 124 | 0 00038  | + 1 4    |
| 128 | 44       | 1 3      |
| 132 | 49       | 1 3      |
| 136 | 54       | 1 3      |
| 140 | 59       | 1 1      |
| 144 | 0 00063  | + 1 0    |
| 148 | 67       | 0 9      |
| 152 | 70       | 0 8      |
| 156 | 73       | 0 6      |
| 160 | 75       | 0 4      |
| 164 | 0 00076  | + 0 1    |
| 168 | 76       | - 0 1    |
| 172 | 75       | 0 3      |
| 176 | 74       | 0 4      |
| 180 | 72       | 0 6      |
| 184 | 0 00069  | - 0 9    |
| 188 | 65       | 1 0      |
| 192 | 61       | 1 0      |
| 196 | 57       | 1 1      |
| 200 | 0 00052  | - 1 1    |

0 t t + 000

| H  | Equation |
|----|----------|
| d  |          |
| 0  | 0 00009  |
| 1  | 10       |
| 2  | 1        |
| 3  | 15       |
| 4  | 19       |
| 5  | 23       |
| 6  | 0 00027  |
| 7  | 30       |
| 8  | 31       |
| 9  | 31       |
| 10 | 29       |
| 11 | 0 00026  |
| 12 | 23       |
| 13 | 18       |
| 14 | 14       |
| 15 | 11       |
| 16 | 0 00009  |
| 17 | 9        |
| 18 | 10       |
| 19 | 13       |
| 20 | 0 00016  |

0 t t + 000

The ig fti Mq ti  
p lti

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXX

Equation of Latitude

Argument J

| 1         | 2        | 3                 | 4                      | 1         | 2        | 3                 | 4                      | 1         | 2        | 3                 | 4                      | 1         | 2        | 3                 | 4                      |
|-----------|----------|-------------------|------------------------|-----------|----------|-------------------|------------------------|-----------|----------|-------------------|------------------------|-----------|----------|-------------------|------------------------|
| J         | Equation | $\Delta$<br>0d.01 | $\frac{1}{2} \Delta^2$ | J         | Equation | $\Delta$<br>0d.01 | $\frac{1}{2} \Delta^2$ | J         | Equation | $\Delta$<br>0d.01 | $\frac{1}{2} \Delta^2$ | J         | Equation | $\Delta$<br>0d.01 | $\frac{1}{2} \Delta^2$ |
| d<br>0.00 | 1.34000  | +494.8            | 0.0                    | d<br>2.00 | 2.23911  | +361.5            | -0.6                   | d<br>4.00 | 2.65286  | +32.0             | -0.9                   | d<br>6.00 | 2.35578  | -315.0            | -0.7                   |
| .04       | 1.35979  | 494.8             | 0.0                    | .04       | 2.25347  | 356.4             | 0.6                    | .04       | 2.65399  | 24.5              | 0.9                    | .04       | 2.34306  | 320.4             | 0.7                    |
| .08       | 1.37958  | 494.6             | 0.0                    | .08       | 2.26762  | 351.3             | 0.6                    | .08       | 2.65482  | 17.1              | 0.9                    | .08       | 2.33015  | 325.9             | 0.7                    |
| .12       | 1.39936  | 494.3             | 0.0                    | .12       | 2.28157  | 346.1             | 0.7                    | .12       | 2.65536  | 9.8               | 0.9                    | .12       | 2.31699  | 331.9             | 0.7                    |
| .16       | 1.41912  | 493.8             | 0.0                    | .16       | 2.29531  | 340.6             | 0.7                    | .16       | 2.65560  | +2.3              | 0.9                    | .16       | 2.30360  | 337.4             | 0.7                    |
| .20       | 1.43886  | 493.4             | 0.0                    | .20       | 2.30882  | 335.1             | 0.7                    | .20       | 2.65554  | -5.3              | 0.9                    | .20       | 2.29000  | 342.8             | 0.7                    |
| 0.24      | 1.45859  | +492.9            | 0.0                    | 2.24      | 2.32212  | +329.8            | -0.7                   | 4.24      | 2.65518  | -12.8             | -0.9                   | 6.24      | 2.27618  | -348.0            | -0.7                   |
| .28       | 1.47829  | 492.0             | -0.1                   | .28       | 2.33520  | 324.1             | 0.7                    | .28       | 2.65452  | 20.1              | 0.9                    | .28       | 2.26216  | 353.3             | 0.7                    |
| .32       | 1.49795  | 491.1             | 0.1                    | .32       | 2.34805  | 318.3             | 0.7                    | .32       | 2.65357  | 27.5              | 0.9                    | .32       | 2.24792  | 358.4             | 0.6                    |
| .36       | 1.51758  | 490.3             | 0.1                    | .36       | 2.36066  | 312.5             | 0.7                    | .36       | 2.65232  | 35.0              | 0.9                    | .36       | 2.23349  | 363.4             | 0.6                    |
| .40       | 1.53717  | 489.1             | 0.1                    | .40       | 2.37305  | 306.9             | 0.7                    | .40       | 2.65077  | 42.5              | 0.9                    | .40       | 2.21885  | 368.6             | 0.7                    |
| 0.44      | 1.55671  | +488.0            | -0.1                   | 2.44      | 2.38521  | +301.0            | -0.7                   | 4.44      | 2.64892  | -49.9             | -0.9                   | 6.44      | 2.20400  | -374.0            | -0.6                   |
| .48       | 1.57621  | 486.9             | 0.2                    | .48       | 2.39713  | 295.0             | 0.8                    | .48       | 2.64678  | 57.4              | 0.9                    | .48       | 2.18897  | 378.4             | 0.6                    |
| .52       | 1.59566  | 485.5             | 0.2                    | .52       | 2.40881  | 289.0             | 0.8                    | .52       | 2.64433  | 64.9              | 0.9                    | .52       | 2.17373  | 383.1             | 0.6                    |
| .56       | 1.61505  | 483.9             | 0.2                    | .56       | 2.42025  | 282.9             | 0.8                    | .56       | 2.64159  | 72.3              | 0.9                    | .56       | 2.15832  | 387.6             | 0.6                    |
| .60       | 1.63437  | 482.3             | 0.2                    | .60       | 2.43144  | 276.5             | 0.8                    | .60       | 2.63855  | 79.6              | 0.9                    | .60       | 2.14272  | 392.3             | 0.6                    |
| 0.64      | 1.65363  | +480.5            | -0.2                   | 2.64      | 2.44237  | +270.1            | -0.8                   | 4.64      | 2.63522  | -87.0             | -0.9                   | 6.64      | 2.12694  | -396.8            | -0.6                   |
| .68       | 1.67281  | 478.6             | 0.2                    | .68       | 2.45305  | 263.9             | 0.8                    | .68       | 2.63159  | 94.4              | 0.9                    | .68       | 2.11098  | 401.3             | 0.5                    |
| .72       | 1.69192  | 476.8             | 0.2                    | .72       | 2.46348  | 257.8             | 0.8                    | .72       | 2.62767  | 101.5             | 0.9                    | .72       | 2.09484  | 405.5             | 0.5                    |
| .76       | 1.71095  | 474.8             | 0.3                    | .76       | 2.47367  | 251.6             | 0.8                    | .76       | 2.62347  | 108.8             | 0.9                    | .76       | 2.07854  | 409.5             | 0.5                    |
| .80       | 1.72990  | 472.6             | 0.3                    | .80       | 2.48361  | 245.0             | 0.8                    | .80       | 2.61897  | 116.1             | 0.9                    | .80       | 2.06208  | 413.8             | 0.5                    |
| 0.84      | 1.74876  | +470.4            | -0.3                   | 2.84      | 2.49327  | +238.4            | -0.8                   | 4.84      | 2.61418  | -123.5            | -0.9                   | 6.84      | 2.04544  | -418.0            | -0.5                   |
| .88       | 1.76753  | 468.0             | 0.3                    | .88       | 2.50268  | 231.9             | 0.8                    | .88       | 2.60909  | 130.8             | 0.9                    | .88       | 2.02864  | 421.9             | 0.5                    |
| .92       | 1.78620  | 465.5             | 0.3                    | .92       | 2.51182  | 225.3             | 0.8                    | .92       | 2.60372  | 137.8             | 0.9                    | .92       | 2.01169  | 425.6             | 0.5                    |
| .96       | 1.80477  | 463.0             | 0.3                    | .96       | 2.52070  | 218.6             | 0.8                    | .96       | 2.59807  | 145.0             | 0.9                    | .96       | 1.99459  | 429.5             | 0.5                    |
| 1.00      | 1.82324  | 460.4             | 0.3                    | 3.00      | 2.52931  | 211.9             | 0.9                    | 5.00      | 2.59212  | 152.1             | 0.9                    | 7.00      | 1.97733  | 433.1             | 0.4                    |
| 1.04      | 1.84160  | +457.5            | -0.4                   | 3.04      | 2.53765  | +205.0            | -0.8                   | 5.04      | 2.58590  | -159.3            | -0.9                   | 7.04      | 1.95994  | -436.5            | -0.4                   |
| .08       | 1.85984  | 454.6             | 0.4                    | .08       | 2.54571  | 198.4             | 0.9                    | .08       | 2.57938  | 166.5             | 0.9                    | .08       | 1.94241  | 440.0             | 0.4                    |
| .12       | 1.87797  | 451.8             | 0.4                    | .12       | 2.55352  | 191.4             | 0.9                    | .12       | 2.57258  | 173.4             | 0.9                    | .12       | 1.92474  | 443.5             | 0.4                    |
| .16       | 1.89598  | 448.5             | 0.4                    | .16       | 2.56104  | 184.5             | 0.9                    | .16       | 2.56551  | 180.4             | 0.9                    | .16       | 1.90693  | 446.8             | 0.4                    |
| .20       | 1.91385  | 445.1             | 0.4                    | .20       | 2.56828  | 177.6             | 0.9                    | .20       | 2.55815  | 187.4             | 0.9                    | .20       | 1.88900  | 449.8             | 0.4                    |
| 1.24      | 1.93159  | +441.9            | -0.4                   | 3.24      | 2.57525  | +170.8            | -0.9                   | 5.24      | 2.55052  | -194.1            | -0.8                   | 7.24      | 1.87095  | -452.9            | -0.4                   |
| .28       | 1.94920  | 438.6             | 0.4                    | .28       | 2.58194  | 163.6             | 0.9                    | .28       | 2.54262  | 200.9             | 0.9                    | .28       | 1.85277  | 455.9             | 0.4                    |
| .32       | 1.96668  | 435.4             | 0.4                    | .32       | 2.58834  | 156.5             | 0.9                    | .32       | 2.53445  | 207.8             | 0.9                    | .32       | 1.83448  | 458.6             | 0.3                    |
| .36       | 1.98403  | 431.9             | 0.5                    | .36       | 2.59446  | 149.3             | 0.9                    | .36       | 2.52600  | 214.6             | 0.8                    | .36       | 1.81608  | 461.4             | 0.3                    |
| .40       | 2.00123  | 428.1             | 0.5                    | .40       | 2.60028  | 142.1             | 0.9                    | .40       | 2.51728  | 221.1             | 0.8                    | .40       | 1.79757  | 464.1             | 0.3                    |
| 1.44      | 2.01828  | +424.1            | -0.5                   | 3.44      | 2.60583  | +135.3            | -0.9                   | 5.44      | 2.50831  | -227.6            | -0.8                   | 7.44      | 1.77895  | -466.3            | -0.3                   |
| .48       | 2.03516  | 420.3             | 0.5                    | .48       | 2.61110  | 128.1             | 0.9                    | .48       | 2.49907  | 234.4             | 0.8                    | .48       | 1.76027  | 468.6             | 0.3                    |
| .52       | 2.05190  | 416.5             | 0.5                    | .52       | 2.61608  | 120.8             | 0.9                    | .52       | 2.48956  | 241.0             | 0.8                    | .52       | 1.74146  | 471.4             | 0.3                    |
| .56       | 2.06848  | 412.4             | 0.5                    | .56       | 2.62076  | 113.4             | 0.9                    | .56       | 2.47979  | 247.6             | 0.8                    | .56       | 1.72256  | 473.6             | 0.3                    |
| .60       | 2.08489  | 408.1             | 0.5                    | .60       | 2.62515  | 106.1             | 0.9                    | .60       | 2.46975  | 254.1             | 0.8                    | .60       | 1.70357  | 475.4             | 0.2                    |
| 1.64      | 2.10113  | +403.9            | -0.5                   | 3.64      | 2.62925  | +98.9             | -0.9                   | 5.64      | 2.45946  | -260.3            | -0.8                   | 7.64      | 1.68453  | -477.5            | -0.3                   |
| .68       | 2.11720  | 399.4             | 0.6                    | .68       | 2.63306  | 91.5              | 0.9                    | .68       | 2.44893  | 266.5             | 0.8                    | .68       | 1.66537  | 479.6             | 0.2                    |
| .72       | 2.13308  | 394.9             | 0.6                    | .72       | 2.63657  | 84.0              | 0.9                    | .72       | 2.43814  | 272.9             | 0.8                    | .72       | 1.64616  | 481.1             | 0.2                    |
| .76       | 2.14879  | 390.5             | 0.6                    | .76       | 2.63978  | 76.6              | 0.9                    | .76       | 2.42710  | 279.1             | 0.8                    | .76       | 1.62688  | 482.9             | 0.2                    |
| .80       | 2.16432  | 386.0             | 0.6                    | .80       | 2.64270  | 69.4              | 0.9                    | .80       | 2.41581  | 285.3             | 0.8                    | .80       | 1.60753  | 484.5             | 0.2                    |
| 1.84      | 2.17967  | +381.3            | -0.6                   | 3.84      | 2.64533  | +62.0             | -0.9                   | 5.84      | 2.40428  | -291.3            | -0.8                   | 7.84      | 1.58812  | -486.0            | -0.2                   |
| .88       | 2.19482  | 376.4             | 0.6                    | .88       | 2.64766  | 54.6              | 0.9                    | .88       | 2.39251  | 297.3             | 0.7                    | .88       | 1.56865  | 487.5             | 0.2                    |
| .92       | 2.20978  | 371.6             | 0.6                    | .92       | 2.64970  | 47.1              | 0.9                    | .92       | 2.38050  | 303.1             | 0.7                    | .92       | 1.54912  | 488.6             | 0.1                    |
| .96       | 2.22455  | 366.6             | 0.6                    | .96       | 2.65143  | 39.5              | 0.9                    | .96       | 2.36826  | 309.0             | 0.7                    | .96       | 1.52956  | 489.5             | 0.1                    |
| 2.00      | 2.23911  | +361.5            | -0.6                   | 4.00      | 2.65286  | +32.0             | -0.9                   | 6.00      | 2.35578  | -315.0            | -0.7                   | 8.00      | 1.50996  | -490.5            | -0.1                   |

Applied Constant: +1.34000.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXX continued

Equation of Latitude

Argument J

| J     | Equation | $\Delta$<br>o | $\Delta$<br>I | J     | Equation | $\Delta$<br>o | $\Delta$<br>I | J     | Equation | $\Delta$<br>o | $\Delta$<br>I | J     | Equation | $\Delta$<br>o | $\Delta$<br>I |
|-------|----------|---------------|---------------|-------|----------|---------------|---------------|-------|----------|---------------|---------------|-------|----------|---------------|---------------|
| 8 00  | 1 50996  | 490 5         | -0 1          | 10 00 | 57264    | -40 3         | +0 5          | 12 00 | 0 049 4  | - 96 0        | +0 9          | 14 00 | 0 2 457  | + 62 8        | +0 8          |
| 04    | 1 49 3   | 491 4         | 0 1           | 04    | 55664    | 397 8         | 6             | 04    | 4555     | 88 6          | 0 9           | 04    | 3521     | 69 1          | 0 8           |
| 08    | 1 47 65  | 49 1          | I             | 08    | 5408     | 393 3         | 0 6           | 08    | 4 15     | 81 3          | 9             | 08    | 4610     | 275 3         | 0 8           |
| 12    | 1 45095  | 49 9          | I             | 12    | 52518    | 388 8         | 0 6           | 12    | 39 5     | 73 9          | 0 9           | 12    | 57 3     | 281 3         | 0 8           |
| 16    | 1 43     | 493 6         | 0 1           | 16    | 5 97     | 384 3         | 0 6           | 16    | 3624     | 66 4          | 0 9           | 16    | 6860     | 287 4         | 0 8           |
| 20    | 1 41146  | 494 1         | -0 1          | 20    | 49444    | 379 5         | 6             | 20    | 3374     | 58 8          | 0 9           | 20    | 280 2    | 93 4          | 0 8           |
| 8 24  | 1 39169  | -494 5        | 0             | 10 24 | 0 47936  | -374 6        | +0 6          | 12 24 | 0 03154  | - 51 4        | +0 9          | 14 24 | 0 9207   | +299 8        | +0 8          |
| 28    | 1 37190  | 494 8         |               | 28    | 46447    | 369 6         | 0 6           | 28    | 2963     | 44 4          | 0 9           | 28    | 3 4      | 305 9         | 0 7           |
| 32    | 1 35211  | 494 8         | 0 0           | 32    | 44979    | 364 5         | 6             | 32    | 799      | 36 9          | 0 9           | 32    | 31654    | 311 4         | 0 7           |
| 36    | 33 3     | 494 8         |               | 36    | 43531    | 359 6         | 0 6           | 36    | 2668     | 9 3           | 0 9           | 36    | 32911    | 317 1         | 0 7           |
| 40    | 1 31253  | 494 5         | 0             | 40    | 4 10     | 354 5         | 0 6           | 40    | 2565     | 1 9           | 9             | 40    | 34191    | 3 8           | 0 7           |
| 8 44  | 1 9 76   | -494 3        |               | 10 44 | 40695    | -349 3        | +0 7          | 12 44 | 0 02493  | - 14 3        | +0 9          | 14 44 | 0 35493  | +3 8 3        | +0 7          |
| 48    | 1 7 99   | 494 1         | 0 0           | 48    | 39308    | 344 0         | 0 7           | 48    | 451      | - 6 8         | 0 9           | 48    | 36817    | 333 9         | 0 7           |
| 52    | 1 53 3   | 493 8         | +0 1          | 52    | 37943    | 338 4         | 0 7           | 52    | 439      | + 0 6         | 0 9           | 52    | 38164    | 339 3         | 0 7           |
| 56    | 1 3349   | 493 1         | 0 1           | 56    | 36601    | 332 9         | 0 7           | 56    | 456      | 8 0           | 0 9           | 56    | 39531    | 344 6         | 0 7           |
| 60    | 1 1378   | 49 5          | I             | 60    | 35 80    | 3 7 4         | 7             | 60    | 2503     | 15 5          | 0 9           | 60    | 409 1    | 350 0         | 0 7           |
| 8 64  | 1 19409  | -491 8        | +0 1          | 10 64 | 0 3398   | -3 1 8        | +0 7          | 12 64 | 0 02580  | + 23 0        | +0 9          | 14 64 | 0 42331  | +355 3        | +0 7          |
| 68    | 1 17444  | 49 9          |               | 68    | 3 7 6    | 316 1         | 0 7           | 68    | 2687     | 30 5          | 0 9           | 68    | 43763    | 360 5         | 0 6           |
| 72    | 1 1548   | 489 9         | 0 1           | 72    | 31453    | 310 4         | 0 7           | 72    | 824      | 38 0          | 0 9           | 72    | 45215    | 365 5         | 0 6           |
| 76    | 1 135 5  | 488 6         | 2             | 76    | 30 23    | 3 4 5         | 0 7           | 76    | 991      | 45 4          | 0 9           | 76    | 46687    | 370 4         | 0 6           |
| 80    | 1 11573  | 487 4         | 0             | 80    | 9017     | 98 6          | 0 7           | 80    | 3187     | 52 9          | 0 9           | 80    | 48178    | 375 4         | 0 6           |
| 8 84  | 1 09626  | -486 3        | +0            | 10 84 | 0 27834  | -292 6        | +0 8          | 12 84 | 0 03414  | + 60 3        | +0 9          | 14 84 | 0 49690  | +380 3        | +0 6          |
| 88    | 1 07683  | 484 9         | 0             | 88    | 26676    | 286 6         | 0 8           | 88    | 3669     | 67 5          | 0 9           | 88    | 51220    | 384 9         | 0 6           |
| 92    | 1 5747   | 483 3         | 0             | 92    | 554      | 80 5          | 0 0           | 92    | 3954     | 75 1          | 0 9           | 92    | 5 769    | 389 5         | 0 6           |
| 96    | 1 3817   | 48 6          |               | 96    | 443      | 274 4         | 0 8           | 96    | 4 70     | 82 6          | 0 9           | 96    | 54336    | 394           | 0 6           |
| 9 00  | 1 01894  | 479 9         | 0 2           | 11 00 | 3347     | 268 1         | 0 8           | 13 00 | 4615     | 89 9          | 0 9           | 15 00 | 559 1    | 398 5         | 0 6           |
| 9 04  | 0 99978  | -478 0        | +0            | 11 04 | 87       | - 61 8        | +0 8          | 13 04 | 0 04989  | + 97 1        | +0 9          | 15 04 | 0 57524  | +402 9        | +0 5          |
| 08    | 98 7     | 476 1         | 0 3           | 08    | 21253    | 55 4          | 0 8           | 08    | 539      | 104 4         | 0 9           | 08    | 59144    | 407 1         | 0 5           |
| 12    | 96169    | 474           | 0 3           | 12    | 0 44     | 249 0         | 0 8           | 12    | 58 4     | 111 6         | 9             | 12    | 60781    | 411 4         | 0 5           |
| 16    | 94 78    | 471 8         | 0 3           | 16    | 19261    | 4 5           | 8             | 16    | 6 85     | 118 9         | 0 9           | 16    | 62435    | 415 5         | 0 5           |
| 20    | 92395    | 469 6         | 3             | 20    | 18304    | 236 0         | 8             | 20    | 6775     | 126 3         | 0 9           | 20    | 64105    | 419 4         | 0 5           |
| 9 24  | 9 5 1    | -467 3        | +0 3          | 11 24 | 0 17373  | - 29 4        | +0 8          | 13 24 | 0 07 95  | +133 6        | +0 9          | 15 24 | 0 65790  | +423 3        | +0 5          |
| 28    | 88657    | 464 6         | 3             | 28    | 16469    | 6             | 8             | 28    | 7844     | 140 8         | 0 9           | 28    | 67491    | 4 7 1         | 0 5           |
| 32    | 86804    | 46            | 0 3           | 32    | 1559     | 16 0          | 0 8           | 32    | 8421     | 147 8         | 0 9           | 32    | 69 07    | 430 9         | 0 5           |
| 36    | 84961    | 459 3         | 4             | 36    | 14741    | 09 3          | 0 8           | 36    | 9026     | 154 9         | 0 9           | 36    | 70938    | 434 5         | 0 4           |
| 40    | 83130    | 456 3         | 0 4           | 40    | 13918    | 2 2 5         | 8             | 40    | 9660     | 161 9         | 0 9           | 40    | 72683    | 438 0         | 0 4           |
| 9 44  | 0 81311  | -453 3        | +0 4          | 11 44 | 0 131 1  | -195 8        | +0 9          | 13 44 | 0 103 1  | +169 0        | +0 9          | 15 44 | 0 74442  | +441 4        | +0 4          |
| 48    | 79504    | 45 3          | 4             | 48    | 1235     | 188 5         | 0 9           | 48    | 1101     | 176 3         | 0 9           | 48    | 76214    | 444 6         | 0 4           |
| 52    | 777 9    | 447 3         | 4             | 52    | 11613    | 181 6         | 9             | 52    | 11731    | 183 0         | 0 8           | 52    | 77999    | 447 9         | 4             |
| 56    | 759 6    | 444 1         | 0 4           | 56    | 10899    | 175 0         | 0 9           | 56    | 1 476    | 189 8         | 0 9           | 56    | 79797    | 451 0         | 0 4           |
| 60    | 74156    | 44 9          | 0 4           | 60    | 10213    | 167 9         | 0 9           | 60    | 13 49    | 196 8         | 0 9           | 60    | 81607    | 454 0         | 0 4           |
| 9 64  | 0 7 399  | -437 4        | +0 4          | 11 64 | 0 9556   | -16 9         | + 9           | 13 64 | 0 14050  | +203 6        | +0 9          | 15 64 | 0 83429  | +457 0        | +0 4          |
| 68    | 70657    | 433 8         | 4             | 68    | 89 6     | 153 9         | 0 9           | 68    | 14878    | 10 4          | 0 8           | 68    | 85 63    | 459 9         | 3             |
| 72    | 689 9    | 430 3         | 0 5           | 72    | 83 5     | 146 6         | 9             | 72    | 15733    | 217 0         | 0 8           | 72    | 87108    | 462 5         | 0 3           |
| 76    | 67 5     | 4 66          | 0 5           | 76    | 7753     | 139 5         | 0 9           | 76    | 16614    | 3 8           | 0 8           | 76    | 88963    | 465 0         | 0 3           |
| 80    | 65516    | 4 6           | 0 5           | 80    | 7 09     | 13 4          | 0 9           | 80    | 175 3    | 30 5          | 0 8           | 80    | 90828    | 467 5         | 0 3           |
| 9 84  | 63834    | -418 6        | +0 5          | 11 84 | 6694     | -1 5 1        | +0 9          | 13 84 | 18458    | + 37          | +0 8          | 15 84 | 0 92703  | +469 9        | +0 3          |
| 88    | 6 167    | 414 8         | 5             | 88    | 6 8      | 117 9         | 0 9           | 88    | 19419    | 43 5          | 0 8           | 88    | 94587    | 472 3         | 0 3           |
| 92    | 6 516    | 41 6          | 5             | 92    | 5751     | 110 6         | 0 9           | 92    | 20406    | 250 0         | 0 8           | 92    | 96481    | 474 4         | 0 3           |
| 96    | 58882    | 406 5         | 5             | 96    | 53 3     | 103 4         | 0 9           | 96    | 21419    | 56 4          | 0 8           | 96    | 98382    | 476 3         | 0 2           |
| 10 00 | 0 57 64  | -402 3        | +0 5          | 12 00 | 0 04924  | - 96 0        | + 9           | 14 00 | 0 457    | +26 8         | +0 8          | 16 00 | 1 00291  | +478 3        | +0 2          |

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

Equations of Latitude

XXX continued

XXXI

| 1     | 2        | 3                              | 4                      |
|-------|----------|--------------------------------|------------------------|
| J     | Equation | $\Delta$<br>0 <sup>d</sup> .01 | $\frac{1}{2} \Delta^2$ |
| d     |          |                                |                        |
| 16°00 | 1°00291  | +478,3                         | +0,2                   |
| 04    | 1°02208  | 480,1                          | 0,2                    |
| 08    | 1°04132  | 481,9                          | 0,2                    |
| 12    | 1°06063  | 483,5                          | 0,2                    |
| 16    | 1°08000  | 485,0                          | 0,2                    |
| 20    | 1°09943  | 486,4                          | 0,2                    |
| 16°24 | 1°11891  | +487,6                         | +0,2                   |
| 28    | 1°13844  | 488,9                          | 0,2                    |
| 32    | 1°15802  | 490,0                          | 0,1                    |
| 36    | 1°17764  | 491,0                          | 0,1                    |
| 40    | 1°19730  | 491,8                          | 0,1                    |
| 16°44 | 1°21698  | +492,5                         | +0,1                   |
| 48    | 1°23670  | 493,3                          | 0,1                    |
| 52    | 1°25644  | 493,8                          | +0,1                   |
| 56    | 1°27620  | 494,1                          | 0,0                    |
| 60    | 1°29597  | 494,5                          | 0,0                    |
| 16°64 | 1°31576  | +494,8                         | 0,0                    |
| 68    | 1°33555  | 494,9                          | 0,0                    |
| 72    | 1°35535  | 494,8                          | 0,0                    |
| 76    | 1°37513  | 494,5                          | 0,0                    |
| 80    | 1°39491  | 494,4                          | 0,0                    |
| 16°84 | 1°41468  | +494,0                         | -0,1                   |
| 88    | 1°43443  | 493,5                          | 0,1                    |
| 92    | 1°45416  | 492,9                          | 0,1                    |
| 96    | 1°47386  | 491,9                          | 0,1                    |
| 17°00 | 1°49351  | 491,1                          | 0,1                    |
| 17°04 | 1°51315  | +490,5                         | -0,1                   |
| 08    | 1°53275  | 489,5                          | 0,1                    |
| 12    | 1°55231  | 488,4                          | 0,2                    |
| 16    | 1°57182  | 487,1                          | 0,2                    |
| 20    | 1°59128  | 485,8                          | 0,2                    |
| 17°24 | 1°61068  | +484,3                         | -0,2                   |
| 28    | 1°63002  | 482,8                          | 0,2                    |
| 32    | 1°64930  | 481,0                          | 0,2                    |
| 36    | 1°66850  | 479,1                          | 0,2                    |
| 40    | 1°68763  | 477,1                          | 0,3                    |
| 17°44 | 1°70667  | +475,1                         | -0,3                   |
| 48    | 1°72564  | 473,0                          | 0,3                    |
| 52    | 1°74451  | 470,8                          | 0,3                    |
| 56    | 1°76330  | 468,5                          | 0,3                    |
| 60    | 1°78199  | 466,1                          | 0,3                    |
| 17°64 | 1°80059  | +463,6                         | -0,3                   |
| 68    | 1°81908  | 460,9                          | 0,3                    |
| 72    | 1°83746  | 458,1                          | 0,3                    |
| 76    | 1°85573  | 455,4                          | 0,4                    |
| 80    | 1°87389  | 452,5                          | 0,4                    |
| 17°84 | 1°89193  | +449,4                         | -0,4                   |
| 88    | 1°90984  | 446,1                          | 0,4                    |
| 92    | 1°92762  | 442,8                          | 0,4                    |
| 96    | 1°94526  | 439,4                          | 0,4                    |
| 18°00 | 1°96277  | +436,1                         | -0,4                   |

Constant: +1°34000.

| 1    | 2        | 3                              | 1    | 2        | 3                              | 1    | 2        | 3                              |
|------|----------|--------------------------------|------|----------|--------------------------------|------|----------|--------------------------------|
| M    | Equation | $\Delta$<br>0 <sup>d</sup> .01 | M    | Equation | $\Delta$<br>0 <sup>d</sup> .01 | M    | Equation | $\Delta$<br>0 <sup>d</sup> .01 |
| d    |          |                                | d    |          |                                | d    |          |                                |
| 0°00 | 0°14000  | +50,4                          | 2°50 | 0°24804  | +29,6                          | 5°00 | 0°26722  | -15,4                          |
| 05   | 1°14252  | 50,3                           | 55   | 2°24950  | 28,8                           | 05   | 2°26643  | 16,3                           |
| 10   | 1°14503  | 50,2                           | 60   | 2°25092  | 28,0                           | 10   | 2°26559  | 17,2                           |
| 15   | 1°14754  | 50,2                           | 65   | 2°25230  | 27,2                           | 15   | 2°26471  | 18,1                           |
| 20   | 1°15005  | 50,2                           | 70   | 2°25364  | 26,4                           | 20   | 2°26378  | 19,1                           |
| 25   | 1°15256  | 50,1                           | 75   | 2°25494  | 25,6                           | 25   | 2°26280  | 20,0                           |
| 0°30 | 0°15506  | +50,0                          | 2°80 | 0°25620  | +24,8                          | 5°30 | 0°26178  | -20,8                          |
| 35   | 1°15756  | 49,9                           | 85   | 2°25742  | 24,0                           | 35   | 2°26072  | 21,6                           |
| 40   | 1°16005  | 49,7                           | 90   | 2°25860  | 23,2                           | 40   | 2°25962  | 22,4                           |
| 45   | 1°16253  | 49,6                           | 95   | 2°25974  | 22,5                           | 45   | 2°25848  | 23,3                           |
| 50   | 1°16501  | 49,5                           | 3°00 | 2°26085  | 21,6                           | 50   | 2°25729  | 24,2                           |
| 0°55 | 0°16748  | +49,3                          | 3°05 | 0°26190  | +20,6                          | 5°55 | 0°25606  | -25,0                          |
| 60   | 1°16994  | 49,1                           | 10   | 2°26291  | 19,8                           | 60   | 2°25479  | 25,8                           |
| 65   | 1°17239  | 48,9                           | 15   | 2°26388  | 18,9                           | 65   | 2°25348  | 26,6                           |
| 70   | 1°17483  | 48,6                           | 20   | 2°26480  | 18,0                           | 70   | 2°25213  | 27,4                           |
| 75   | 1°17725  | 48,3                           | 25   | 2°26568  | 17,1                           | 75   | 2°25074  | 28,2                           |
| 0°80 | 0°17966  | +48,1                          | 3°30 | 0°26651  | +16,2                          | 5°80 | 0°24931  | -28,9                          |
| 85   | 1°18206  | 47,8                           | 35   | 2°26730  | 15,4                           | 85   | 2°24785  | 29,6                           |
| 90   | 1°18444  | 47,4                           | 40   | 2°26805  | 14,5                           | 90   | 2°24635  | 30,4                           |
| 95   | 1°18680  | 47,1                           | 45   | 2°26875  | 13,5                           | 95   | 2°24481  | 31,2                           |
| 1°00 | 1°18915  | 46,8                           | 50   | 2°26940  | 12,6                           | 6°00 | 2°24323  | 32,0                           |
| 1°05 | 0°19148  | +46,4                          | 3°55 | 0°27001  | +11,7                          | 6°05 | 0°24161  | -32,7                          |
| 10   | 1°19379  | 46,0                           | 60   | 2°27057  | 10,7                           | 10   | 2°23996  | 33,4                           |
| 15   | 1°19608  | 45,6                           | 65   | 2°27108  | 9,8                            | 15   | 2°23827  | 34,1                           |
| 20   | 1°19835  | 45,2                           | 70   | 2°27155  | 8,9                            | 20   | 2°23655  | 34,7                           |
| 25   | 2°0060   | 44,8                           | 75   | 2°27197  | 7,9                            | 25   | 2°23480  | 35,4                           |
| 1°30 | 0°20283  | +44,4                          | 3°80 | 0°27234  | +7,0                           | 6°30 | 0°23301  | -36,1                          |
| 35   | 2°0504   | 44,0                           | 85   | 2°27267  | 6,1                            | 35   | 2°23119  | 36,8                           |
| 40   | 2°0723   | 43,6                           | 90   | 2°27295  | 5,1                            | 40   | 2°22933  | 37,5                           |
| 45   | 2°0940   | 43,1                           | 95   | 2°27318  | 4,2                            | 45   | 2°22744  | 38,1                           |
| 50   | 2°1154   | 42,6                           | 4°00 | 2°27337  | 3,3                            | 50   | 2°22552  | 38,7                           |
| 1°55 | 0°21366  | +42,1                          | 4°05 | 0°27351  | +2,3                           | 6°55 | 0°22357  | -39,3                          |
| 60   | 2°1575   | 41,5                           | 10   | 2°27360  | 1,4                            | 60   | 2°22159  | 39,9                           |
| 65   | 2°1781   | 40,9                           | 15   | 2°27365  | +0,5                           | 65   | 2°21958  | 40,5                           |
| 70   | 2°1984   | 40,3                           | 20   | 2°27365  | -0,5                           | 70   | 2°21754  | 41,0                           |
| 75   | 2°2184   | 39,7                           | 25   | 2°27360  | 1,5                            | 75   | 2°21548  | 41,5                           |
| 1°80 | 0°22381  | +39,1                          | 4°30 | 0°27350  | -2,4                           | 6°80 | 0°21339  | -42,1                          |
| 85   | 2°22575  | 38,5                           | 35   | 2°27336  | 3,3                            | 85   | 2°21127  | 42,6                           |
| 90   | 2°22766  | 37,9                           | 40   | 2°27317  | 4,3                            | 90   | 2°20913  | 43,1                           |
| 95   | 2°22954  | 37,3                           | 45   | 2°27293  | 5,3                            | 95   | 2°20696  | 43,6                           |
| 2°00 | 2°23139  | 36,7                           | 50   | 2°27264  | 6,2                            | 7°00 | 2°20477  | 43,9                           |
| 2°05 | 0°23321  | +36,1                          | 4°55 | 0°27231  | -7,1                           | 7°05 | 0°20257  | -44,3                          |
| 10   | 2°23500  | 35,4                           | 60   | 2°27193  | 8,1                            | 10   | 2°20034  | 44,9                           |
| 15   | 2°23675  | 34,7                           | 65   | 2°27150  | 9,0                            | 15   | 1°19808  | 45,4                           |
| 20   | 2°23847  | 34,0                           | 70   | 2°27103  | 9,9                            | 20   | 1°19580  | 45,8                           |
| 25   | 2°24015  | 33,3                           | 75   | 2°27051  | 10,9                           | 25   | 1°19350  | 46,1                           |
| 2°30 | 0°24180  | +32,7                          | 4°80 | 0°26994  | -11,8                          | 7°30 | 0°19119  | -46,4                          |
| 35   | 2°24342  | 32,0                           | 85   | 2°26933  | 12,7                           | 35   | 1°18886  | 46,8                           |
| 40   | 2°24500  | 31,2                           | 90   | 2°26867  | 13,6                           | 40   | 1°18651  | 47,2                           |
| 45   | 2°24654  | 30,4                           | 95   | 2°26797  | 14,5                           | 45   | 1°18414  | 47,5                           |
| 2°50 | 0°24804  | +29,6                          | 5°00 | 0°26722  | -15,4                          | 7°50 | 0°18176  | -47,8                          |

Applied Constant: +0°14000.



# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXXI continued

Equation of Latitude

Argument M

| M     | Equation | $\Delta$<br>od oi | M     | Equation | $\Delta$<br>o o | M     | Equation | $\Delta$<br>o oi | M     | Equation | $\Delta$<br>od oi | M     | Equation | $\Delta$<br>od oi |
|-------|----------|-------------------|-------|----------|-----------------|-------|----------|------------------|-------|----------|-------------------|-------|----------|-------------------|
| 7 50  | o 18176  | -47 8             | 10 00 | o 06194  | -40 9           | 12 50 | o 00635  | - 0 3            | 15 00 | o 06067  | +40 6             | 17 50 | o 18025  | +48 1             |
| 55    | 17936    | 48 1              | 05    | 5991     | 40 3            | 55    | 636      | + 0 6            | 05    | 6 71     | 41 1              | 55    | 18265    | 47 8              |
| 60    | 17695    | 48 3              | 10    | 5791     | 39 7            | 60    | 641      | 1 5              | 10    | 6478     | 41 6              | 60    | 18503    | 47 4              |
| 65    | 17453    | 48 6              | 15    | 5594     | 39 0            | 65    | 651      | 2 5              | 15    | 6687     | 4 1               | 65    | 18739    | 47 0              |
| 70    | 17 9     | 48 9              | 20    | 54 1     | 38 4            | 70    | 666      | 3 5              | 20    | 6899     | 42 6              | 70    | 18973    | 46 6              |
| 75    | 16964    | 49 1              | 25    | 5 10     | 37 9            | 75    | 686      | 4 5              | 25    | 7113     | 43 1              | 75    | 19205    | 46 3              |
| 7 80  | 16718    | -49 3             | 10 30 | o 0502   | -37 3           | 12 80 | o 00711  | + 5 4            | 15 30 | o 07330  | +43 6             | 17 80 | o 19436  | +45 9             |
| 85    | 16471    | 49 5              | 35    | 4837     | 36 7            | 85    | 74       | 6 3              | 35    | 7549     | 44 0              | 85    | 19664    | 45 5              |
| 90    | 16 3     | 49 6              | 40    | 4655     | 36 0            | 90    | 774      | 7 3              | 40    | 7770     | 44 5              | 90    | 19891    | 45 1              |
| 95    | 15975    | 49 7              | 45    | 4477     | 35 3            | 95    | 813      | 8                | 45    | 7994     | 45 0              | 95    | 0115     | 44 7              |
| 8 00  | 157 6    | 49 9              | 50    | 4302     | 34 6            | 13 00 | 856      | 9 1              | 50    | 8220     | 45 4              | 18 00 | 20338    | 44 3              |
| 8 05  | o 15476  | -50 0             | 10 55 | o 04131  | -33 9           | 13 05 | o 00904  | +10 1            | 15 55 | o 08448  | +45 8             | 18 05 | o 20558  | +43 9             |
| 10    | 15 6     | 5 1               | 60    | 3963     | 33              | 10    | 957      | 11 0             | 60    | 8678     | 46                | 10    | 20777    | 43 5              |
| 15    | 14975    | 50 2              | 65    | 3799     | 3 5             | 15    | 1014     | 11 9             | 65    | 8910     | 46 6              | 15    | 0993     | 43 0              |
| 20    | 147 4    | 50                | 70    | 3638     | 31 8            | 20    | 1076     | 1 8              | 70    | 9144     | 46 9              | 20    | 21 07    | 42 5              |
| 25    | 14473    | 50 3              | 75    | 3481     | 31              | 25    | 111      | 13 7             | 75    | 9379     | 47 2              | 25    | 1418     | 41 9              |
| 8 30  | o 14 1   | -5 4              | 10 80 | o 03328  | -30 3           | 13 30 | o 0113   | +14 6            | 15 80 | o 9616   | +47 5             | 18 30 | o 21626  | +41 4             |
| 35    | 13969    | 50 4              | 85    | 3178     | 29 6            | 35    | 1 88     | 15 5             | 85    | 09854    | 47 8              | 35    | 2183     | 40 8              |
| 40    | 13717    | 50 3              | 90    | 3032     | 28 8            | 40    | 1368     | 16 4             | 90    | 10094    | 48 1              | 40    | 034      | 40 1              |
| 45    | 13466    | 50 2              | 95    | 890      | 28 0            | 45    | 1452     | 17 3             | 95    | 10335    | 48 4              | 45    | 22233    | 39 5              |
| 50    | 13 15    | 50 2              | 11 00 | 752      | 27              | 50    | 1541     | 18 2             | 16 00 | 10578    | 48 7              | 50    | 22429    | 39 0              |
| 8 55  | o 12964  | -5 2              | 11 05 | o 0 618  | 6 4             | 13 55 | o 01634  | +19 1            | 16 05 | o 10822  | +48 9             | 18 55 | o 22623  | +38 5             |
| 60    | 12713    | 50 1              | 10    | 488      | 25 6            | 60    | 173      | 0 0              | 10    | 11067    | 49 1              | 60    | 814      | 37 8              |
| 65    | 12463    | 5 0               | 15    | 362      | 4 8             | 65    | 1834     | 0 9              | 15    | 11313    | 49 3              | 65    | 3001     | 37 0              |
| 70    | 12 13    | 49 9              | 20    | 40       | 23 9            | 70    | 1941     | 1 8              | 20    | 11560    | 49 5              | 70    | 3184     | 36 5              |
| 75    | 11964    | 49 7              | 25    | 1 3      | 23 0            | 75    | 052      | 2 6              | 25    | 11808    | 49 7              | 75    | 3366     | 36 0              |
| 8 80  | o 11716  | -49 5             | 11 30 | o 02010  | - 2             | 13 80 | o 02167  | +23 4            | 16 30 | o 1 057  | +49 8             | 18 80 | o 23544  | +35               |
| 85    | 11469    | 49 4              | 35    | 1901     | 1 4             | 85    | 2286     | 24               | 35    | 1 306    | 49 9              | 85    | 23718    | 34 5              |
| 90    | 11       | 49 3              | 40    | 1796     | 20 5            | 90    | 409      | 5 0              | 40    | 1 556    | 50                | 90    | 3889     | 33 8              |
| 95    | 10976    | 49 1              | 45    | 1696     | 19 6            | 95    | 536      | 5 8              | 45    | 1 806    | 50 1              | 95    | 24056    | 33 1              |
| 9 00  | 10731    | 48 8              | 50    | 16       | 18 8            | 14 00 | 2667     | 26 6             | 50    | 13057    | 50 2              | 19 00 | 4 20     | 32 6              |
| 9 05  | o 10488  | -48 5             | 11 55 | o 01508  | -17 9           | 14 05 | o 0 80   | +27 4            | 16 55 | o 13308  | +50 2             | 19 05 | o 4382   | +31 9             |
| 10    | 10 46    | 48 3              | 60    | 1421     | 17 0            | 10    | 2941     | 8                | 60    | 13559    | 50 2              | 10    | 24539    | 31 0              |
| 15    | 1 005    | 48                | 65    | 1338     | 16 1            | 15    | 3084     | 9                | 65    | 13810    | 50 3              | 15    | 24692    | 30 2              |
| 20    | 09766    | 47 7              | 70    | 1 60     | 15              | 20    | 3 31     | 29 8             | 70    | 14062    | 50 4              | 20    | 24841    | 9 4               |
| 25    | 095 8    | 47 5              | 75    | 1186     | 14 3            | 25    | 3382     | 30 6             | 75    | 14314    | 50 3              | 25    | 4986     | 8 6               |
| 9 30  | 09 91    | -47 2             | 11 80 | o 01117  | -13 4           | 14 30 | o 03537  | +31 4            | 16 80 | o 14565  | +50               | 19 30 | o 5127   | +27 8             |
| 35    | 9 56     | 46 8              | 85    | 1052     | 1 5             | 35    | 3696     | 32               | 85    | 14816    | 50                | 35    | 25264    | 7 0               |
| 40    | 8823     | 46 4              | 90    | 992      | 11 5            | 40    | 3859     | 3 9              | 90    | 15067    | 5                 | 40    | 5397     | 6 2               |
| 45    | 8592     | 46                | 95    | 937      | 1 6             | 45    | 40 5     | 33 5             | 95    | 15318    | 50 1              | 45    | 5526     | 25 4              |
| 50    | 8363     | 45 6              | 12 00 | 886      | 9 7             | 50    | 4194     | 34               | 17 00 | 15568    | 50 0              | 50    | 5651     | 24 6              |
| 9 55  | o 08136  | -45               | 12 05 | o 00840  | - 8 8           | 14 55 | o 04367  | +34 9            | 17 05 | o 15818  | +49 9             | 19 55 | o 25772  | +23 8             |
| 60    | 7911     | 44 8              | 10    | 798      | 7 9             | 60    | 4543     | 35 5             | 10    | 16067    | 49 7              | 60    | 5889     | 23 0              |
| 65    | 7688     | 44 4              | 15    | 761      | 6 9             | 65    | 47 2     | 36               | 15    | 16315    | 49 5              | 65    | 6002     | 2 3               |
| 70    | 7467     | 43 9              | 20    | 7 9      | 5 9             | 70    | 4905     | 36 9             | 20    | 16562    | 49 4              | 70    | 6112     | 21 4              |
| 75    | 7 49     | 43 4              | 25    | 7        | 5 0             | 75    | 5 91     | 37 5             | 25    | 168 9    | 49                | 75    | 26 16    | 0 3               |
| 9 80  | o 7033   | -43               | 12 30 | o 00679  | - 4 1           | 14 80 | 05 80    | +38 1            | 17 30 | o 17 54  | +48 9             | 19 80 | o 6315   | +19 5             |
| 85    | 6819     | 4 5               | 35    | 661      | 3 1             | 85    | 5472     | 38 7             | 35    | 17298    | 48 8              | 85    | 6411     | 18 7              |
| 90    | 6608     | 41 9              | 40    | 648      | 2               | 90    | 5667     | 39 3             | 40    | 1754     | 48 6              | 90    | 2650     | 17 8              |
| 95    | 640      | 41 4              | 45    | 639      | 1 3             | 95    | 5865     | 40 0             | 45    | 17784    | 48 3              | 95    | 26589    | 17 0              |
| 10 00 | o 6194   | -40 9             | 50    | o 00635  | - 0 3           | 15 00 | o 06067  | +40 6            | 50    | o 18025  | +48 1             | 20 00 | o 2667   | +16               |



# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

XXXII

Equation of Latitude

Argument N

| 1   | 2        | 3        | 1    | 2        | 3        | 1    | 2        | 3        | 1    | 2        | 3        |
|-----|----------|----------|------|----------|----------|------|----------|----------|------|----------|----------|
| N   | Equation | $\Delta$ | N    | Equation | $\Delta$ | N    | Equation | $\Delta$ | N    | Equation | $\Delta$ |
| d   |          |          | d    |          |          | d    |          |          | d    |          |          |
| 0.0 | 0.01680  | - 55     | 5.0  | 0.00295  | + 17     | 10.0 | 0.02532  | + 45     | 15.0 | 0.02542  | - 45     |
| .1  | 1625     | 55       | .1   | 313      | 19       | .1   | 2576     | 43       | .1   | 2497     | 46       |
| .2  | 1570     | 55       | .2   | 333      | 21       | .2   | 2618     | 42       | .2   | 2451     | 47       |
| .3  | 1516     | 55       | .3   | 355      | 23       | .3   | 2659     | 41       | .3   | 2404     | 48       |
| .4  | 1461     | 55       | .4   | 379      | 25       | .4   | 2699     | 39       | .4   | 2356     | 49       |
| .5  | 1407     | 54       | .5   | 404      | 26       | .5   | 2737     | 38       | .5   | 2307     | 50       |
| 0.6 | 0.01353  | - 54     | 5.6  | 0.00431  | + 28     | 10.6 | 0.02774  | + 36     | 15.6 | 0.02257  | - 51     |
| .7  | 1300     | 53       | .7   | 460      | 30       | .7   | 2809     | 35       | .7   | 2206     | 51       |
| .8  | 1248     | 52       | .8   | 491      | 32       | .8   | 2843     | 33       | .8   | 2155     | 52       |
| .9  | 1196     | 52       | .9   | 523      | 33       | .9   | 2875     | 32       | .9   | 2103     | 53       |
| 1.0 | 1144     | 52       | 6.0  | 557      | 35       | 11.0 | 2906     | 30       | 16.0 | 2050     | 53       |
| 1.1 | 0.01093  | - 51     | 6.1  | 0.00593  | + 37     | 11.1 | 0.02935  | + 28     | 16.1 | 0.01997  | - 54     |
| .2  | 1043     | 50       | .2   | 631      | 38       | .2   | 2962     | 26       | .2   | 1943     | 55       |
| .3  | 994      | 49       | .3   | 669      | 39       | .3   | 2987     | 25       | .3   | 1888     | 55       |
| .4  | 946      | 48       | .4   | 709      | 41       | .4   | 3011     | 23       | .4   | 1834     | 54       |
| .5  | 899      | 46       | .5   | 750      | 42       | .5   | 3032     | 20       | .5   | 1780     | 55       |
| 1.6 | 0.00854  | - 45     | 6.6  | 0.00793  | + 44     | 11.6 | 0.03051  | + 19     | 16.6 | 0.01725  | - 55     |
| .7  | 810      | 44       | .7   | 837      | 45       | .7   | 3069     | 17       | .7   | 1670     | 55       |
| .8  | 767      | 43       | .8   | 882      | 46       | .8   | 3084     | 14       | .8   | 1616     | 55       |
| .9  | 725      | 42       | .9   | 928      | 47       | .9   | 3097     | 12       | .9   | 1561     | 55       |
| 2.0 | 684      | 40       | 7.0  | 975      | 48       | 12.0 | 3108     | 11       | 17.0 | 1507     | 54       |
| 2.1 | 0.00645  | - 39     | 7.1  | 0.01023  | + 49     | 12.1 | 0.03118  | + 9      | 17.1 | 0.01453  | - 55     |
| .2  | 607      | 37       | .2   | 1072     | 50       | .2   | 3126     | 7        | .2   | 1398     | 54       |
| .3  | 571      | 36       | .3   | 1122     | 51       | .3   | 3131     | 5        | .3   | 1345     | 53       |
| .4  | 536      | 34       | .4   | 1173     | 52       | .4   | 3136     | + 2      | .4   | 1292     | 53       |
| .5  | 503      | 32       | .5   | 1225     | 52       | .5   | 3136     | 0        | .5   | 1239     | 52       |
| 2.6 | 0.00472  | - 31     | 7.6  | 0.01277  | + 53     | 12.6 | 0.03136  | - 2      | 17.6 | 0.01188  | - 52     |
| .7  | 442      | 29       | .7   | 1330     | 54       | .7   | 3133     | 5        | .7   | 1136     | 52       |
| .8  | 414      | 27       | .8   | 1384     | 54       | .8   | 3127     | 7        | .8   | 1085     | 51       |
| .9  | 388      | 26       | .9   | 1438     | 54       | .9   | 3120     | 8        | .9   | 1035     | 50       |
| 3.0 | 363      | 24       | 8.0  | 1492     | 54       | 13.0 | 3111     | 10       | 18.0 | 986      | 49       |
| 3.1 | 0.00340  | - 22     | 8.1  | 0.01546  | + 55     | 13.1 | 0.03100  | - 12     | 18.1 | 0.00938  | - 47     |
| .2  | 319      | 20       | .2   | 1601     | 55       | .2   | 3087     | 14       | .2   | 892      | 46       |
| .3  | 301      | 17       | .3   | 1656     | 55       | .3   | 3072     | 16       | .3   | 847      | 45       |
| .4  | 286      | 15       | .4   | 1711     | 56       | .4   | 3055     | 18       | .4   | 802      | 44       |
| .5  | 271      | 14       | .5   | 1767     | 56       | .5   | 3036     | 20       | .5   | 759      | 42       |
| 3.6 | 0.00258  | - 12     | 8.6  | 0.01822  | + 55     | 13.6 | 0.03015  | - 22     | 18.6 | 0.00718  | - 41     |
| .7  | 248      | 10       | .7   | 1876     | 54       | .7   | 2992     | 24       | .7   | 678      | 40       |
| .8  | 239      | 8        | .8   | 1930     | 54       | .8   | 2967     | 26       | .8   | 639      | 39       |
| .9  | 232      | 6        | .9   | 1984     | 54       | .9   | 2941     | 27       | .9   | 601      | 37       |
| 4.0 | 227      | 4        | 9.0  | 2038     | 54       | 14.0 | 2913     | 29       | 19.0 | 565      | 35       |
| 4.1 | 0.00225  | - 2      | 9.1  | 0.02091  | + 53     | 14.1 | 0.02883  | - 31     | 19.1 | 0.00531  | - 34     |
| .2  | 224      | + 1      | .2   | 2143     | 52       | .2   | 2852     | 32       | .2   | 498      | 33       |
| .3  | 226      | 3        | .3   | 2195     | 52       | .3   | 2819     | 34       | .3   | 466      | 31       |
| .4  | 229      | 5        | .4   | 2246     | 51       | .4   | 2784     | 36       | .4   | 436      | 29       |
| .5  | 235      | 7        | .5   | 2296     | 50       | .5   | 2747     | 38       | .5   | 408      | 27       |
| 4.6 | 0.00243  | + 9      | 9.6  | 0.02345  | + 49     | 14.6 | 0.02708  | - 39     | 19.6 | 0.00382  | - 25     |
| .7  | 253      | 11       | .7   | 2393     | 48       | .7   | 2669     | 40       | .7   | 359      | 23       |
| .8  | 265      | 13       | .8   | 2440     | 47       | .8   | 2628     | 42       | .8   | 337      | 21       |
| .9  | 279      | 15       | .9   | 2486     | 46       | .9   | 2586     | 43       | .9   | 317      | 20       |
| 5.0 | 0.00295  | + 17     | 10.0 | 0.02532  | + 45     | 15.0 | 0.02542  | - 45     | 20.0 | 0.00298  | - 18     |

Applied Constant: +0.00690.

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Latitude

XXXIII

| O   | Equation | $\Delta$ | O   | Equation | $\Delta$ |
|-----|----------|----------|-----|----------|----------|
| 00  | 0 0      | + 8      | 100 | 00 099   | - 7      |
| 2   | 35       | 8        | 102 | 86       | 6        |
| 4   | 5        | 8        | 4   | 74       | 6        |
| 6   | 68       | 8        | 6   | 62       | 6        |
| 8   | 284      | 8        | 8   | 5        | 5        |
| 10  | 99       | 8        | 110 | 42       | 5        |
| 12  | 0 0314   | + 7      | 112 | 0 00033  | - 4      |
| 4   | 3 8      | 7        | 4   | 26       | 4        |
| 6   | 34       | 7        | 6   | 19       | 3        |
| 8   | 355      | 6        | 8   | 14       | 2        |
| 20  | 367      | 6        | 120 | 10       |          |
| 22  | 0 00378  | + 6      | 122 | 0 00007  | - 1      |
| 4   | 389      | 5        | 4   | 5        | - 1      |
| 6   | 398      | 5        | 6   | 4        | 0        |
| 8   | 407      | 4        | 8   | 4        | + 1      |
| 30  | 414      | 4        | 130 | 6        | 1        |
| 32  | 0 004 1  | + 3      | 132 | 0 00009  | +        |
| 4   | 4 6      | 3        | 4   | 13       | 2        |
| 6   | 431      | 2        | 6   | 18       | 3        |
| 8   | 434      | 1        | 8   | 25       | 4        |
| 40  | 435      | + 1      | 140 | 3        | 4        |
| 42  | 0 00436  | 0        | 142 | 0 00041  | + 5      |
| 4   | 435      | 1        | 4   | 50       | 5        |
| 6   | 434      | 1        | 6   | 61       | 6        |
| 8   | 431      |          | 8   | 7        | 6        |
| 50  | 4 6      | 3        | 150 | 84       | 6        |
| 52  | 0 004 1  | - 3      | 152 | 0 00097  | + 7      |
| 4   | 415      | 4        | 4   | 111      | 7        |
| 6   | 4 7      | 4        | 6   | 125      | 7        |
| 8   | 399      | 5        | 8   | 140      | 8        |
| 60  | 389      | 5        | 160 | 155      | 8        |
| 62  | 0 00379  | - 6      | 162 | 0 00171  | + 8      |
| 4   | 367      | 6        | 4   | 186      | 8        |
| 6   | 355      | 6        | 6   | 0        | 8        |
| 8   | 34       | 7        | 8   | 18       | 8        |
| 70  | 3 9      | 7        | 170 | 35       | 8        |
| 72  | 0 00314  | - 8      | 172 | 0 00 51  | + 8      |
| 4   | 99       | 8        | 4   | 267      | 8        |
| 6   | 84       | 8        | 6   | 28       | 8        |
| 8   | 69       | 8        | 8   | 97       | 8        |
| 80  | 53       | 8        | 180 | 312      | 7        |
| 82  | 0 00 37  | - 8      | 182 | 0 003 6  | + 7      |
| 4   | 1        | 8        | 4   | 34       | 7        |
| 6   | 05       | 8        | 6   | 353      | 7        |
| 8   | 189      | 8        | 8   | 366      | 6        |
| 90  | 173      | 8        | 190 | 377      | 6        |
| 92  | 0 00157  | - 8      | 192 | 0 0388   | + 5      |
| 4   | 14       | 8        | 4   | 398      | 5        |
| 6   | 1 7      | 7        | 6   | 406      | 4        |
| 8   | 113      | 7        | 8   | 414      | 4        |
| 100 | 00 099   | - 7      | 200 | 0 042    | + 3      |

Appl dC t t +

XXXIV

| P   | Equation |
|-----|----------|
| d   |          |
| 00  | 0 00030  |
| 04  | 34       |
| 08  | 37       |
| 12  | 41       |
| 16  | 44       |
| 20  | 47       |
| 24  | 0 00049  |
| 28  | 51       |
| 32  | 53       |
| 36  | 54       |
| 40  | 55       |
| 44  | 0 00055  |
| 48  | 54       |
| 52  | 53       |
| 56  | 5        |
| 60  | 50       |
| 64  | 0 00047  |
| 68  | 44       |
| 72  | 41       |
| 76  | 38       |
| 80  | 34       |
| 84  | 0 00030  |
| 88  | 7        |
| 92  | 23       |
| 96  | 20       |
| 100 | 16       |
| 104 | 0 00013  |
| 108 | 11       |
| 112 | 9        |
| 116 | 7        |
| 120 | 6        |
| 124 | 0 00005  |
| 128 | 5        |
| 132 | 5        |
| 136 | 6        |
| 140 | 8        |
| 144 | 00010    |
| 148 | 1        |
| 152 | 15       |
| 156 | 18       |
| 160 | 2        |
| 164 | 0 000 6  |
| 168 | 29       |
| 172 | 33       |
| 176 | 37       |
| 180 | 40       |
| 184 | 0 00043  |
| 188 | 46       |
| 192 | 49       |
| 196 | 51       |
| 200 | 0 00053  |

C t t + ∞  
63

XXXV

| Q   | Equation |
|-----|----------|
| 00  | 0 00040  |
| 04  | 45       |
| 08  | 49       |
| 12  | 53       |
| 16  | 57       |
| 20  | 61       |
| 24  | 0 00064  |
| 28  | 66       |
| 32  | 68       |
| 36  | 69       |
| 40  | 70       |
| 44  | 0 00070  |
| 48  | 70       |
| 52  | 68       |
| 56  | 66       |
| 60  | 63       |
| 64  | 0 00060  |
| 68  | 56       |
| 72  | 52       |
| 76  | 48       |
| 80  | 44       |
| 84  | 0 00039  |
| 88  | 35       |
| 92  | 30       |
| 96  | 6        |
| 100 |          |
| 104 | 0 00019  |
| 108 | 16       |
| 112 | 13       |
| 116 | 1        |
| 120 | 10       |
| 124 | 0 00010  |
| 128 | 10       |
| 132 | 11       |
| 136 | 13       |
| 140 | 15       |
| 144 | 0 00018  |
| 148 | 21       |
| 152 | 25       |
| 156 | 9        |
| 160 | 33       |
| 164 | 0 00037  |
| 168 | 4        |
| 172 | 46       |
| 176 | 51       |
| 180 | 55       |
| 184 | 0 0 059  |
| 188 | 62       |
| 192 | 65       |
| 196 | 67       |
| 200 | 0 00069  |

C t t + ∞

XXXVI

| R   | Equation |
|-----|----------|
| d   |          |
| 00  | 0 00030  |
| 04  | 26       |
| 08  | 21       |
| 12  | 17       |
| 16  | 14       |
| 20  | 1        |
| 24  | 0 00007  |
| 28  | 5        |
| 32  | 3        |
| 36  | 2        |
| 40  | 1        |
| 44  | 0 00001  |
| 48  | 2        |
| 52  | 3        |
| 56  | 5        |
| 60  | 7        |
| 64  | 0 00010  |
| 68  | 14       |
| 72  | 18       |
| 76  | 22       |
| 80  | 6        |
| 84  | 0 00030  |
| 88  | 35       |
| 92  | 39       |
| 96  | 43       |
| 100 | 47       |
| 104 | 0 00050  |
| 108 | 53       |
| 112 | 55       |
| 116 | 57       |
| 120 | 58       |
| 124 | 0 00059  |
| 128 | 59       |
| 132 | 58       |
| 136 | 57       |
| 140 | 55       |
| 144 | 0 00052  |
| 148 | 49       |
| 152 | 46       |
| 156 | 42       |
| 160 | 38       |
| 164 | 0 00034  |
| 168 | 29       |
| 172 | 25       |
| 176 | 21       |
| 180 | 17       |
| 184 | 0 00013  |
| 188 | 1        |
| 192 | 7        |
| 196 | 5        |
| 200 | 0 000 3  |

C t t + ∞

# SATELLITE IV

## Tables of Longitude, Latitude, and Radius Vector

### Equations of Latitude

#### XXXVII

#### Occultations and Transits

To correct for the Jovicentric Latitude of the Earth, the Satellite's Latitude as derived from Tables XXX-XXXVI must be supplemented by the term—

$$\pm .643593 R_1 \sin (\odot - \Omega) / \Delta \quad \begin{cases} + \text{Oc.} \\ - \text{Tr.} \end{cases}$$

(9.808611)

where  $R_1$ ,  $\Delta$  are the Geocentric Distances of the Sun and Jupiter respectively, and  $\Omega$  the Longitude of the Ascending Node of Jupiter's Orbit on the Ecliptic. For Occultations employ the natural sign, for Transits the reversed sign.

#### XXXVIII

#### Correction of Latitude for Shadows and Transits

| 1    | 2           |
|------|-------------|
| Lat. | Correction. |
| 0.5  | - .00485    |
| 0.6  | 437         |
| 0.7  | 388         |
| 0.8  | 340         |
| 0.9  | 291         |
| 1.0  | 243         |
| 1.1  | - .00194    |
| 1.2  | 146         |
| 1.3  | 97          |
| 1.4  | - 49        |
| 1.5  | 0           |
| 1.6  | + .00049    |
| 1.7  | 97          |
| 1.8  | 146         |
| 1.9  | 194         |
| 2.0  | 243         |
| 2.1  | + .00291    |
| 2.2  | 340         |
| 2.3  | 388         |
| 2.4  | 437         |
| 2.5  | + .00485    |

This Correction to be applied to Latitude as derived from Tables XXX-XXXVI, before using as an Argument of Semi-duration for Shadows and Transits.

#### XXXIX

#### Angle above Jupiter's Orbit

| 1    | 2          | 3    | 4        |
|------|------------|------|----------|
| Lat. | Angle      | Lat. | $\Delta$ |
| 0.0  | - 3.0496 + | 3.0  | 2030     |
| 0.1  | 2.8466     | 2.9  | 2031     |
| 0.2  | 2.6435     | 2.8  | 2031     |
| 0.3  | 2.4404     | 2.7  | 2031     |
| 0.4  | 2.2373     | 2.6  | 2032     |
| 0.5  | 2.0341     | 2.5  | 2033     |
| 0.6  | - 1.8308 + | 2.4  | 2033     |
| 0.7  | 1.6275     | 2.3  | 2033     |
| 0.8  | 1.4242     | 2.2  | 2034     |
| 0.9  | 1.2208     | 2.1  | 2034     |
| 1.0  | 1.0175     | 2.0  | 2035     |
| 1.1  | - 0.8139 + | 1.9  | 2035     |
| 1.2  | 0.6105     | 1.8  | 2035     |
| 1.3  | 0.4070     | 1.7  | 2035     |
| 1.4  | - 0.2035 + | 1.6  | 2035     |
| 1.5  | 0.0000     | 1.5  | 2035     |

This Table shows the Angle of the Radius Vector of the Satellite above Jupiter's Orbit, which corresponds to the Latitude as derived from Tables XXX-XXXVI.

# SATELLITE IV

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## Tables

of the

Synodic Motion,

Duration of the Phenomena of Eclipse,  
Occultation, Transit and Shadow-Transit,

with

Equations for Reduction to the Middle,

Corrections for Jupiter's Phase,

and the

Light-Curve of Eclipse

# SATELLITE IV

## Tables of Synodic Motion

### XL

| 1          | 2             | 1          | 2             | 1          | 2             | 1          | 2             | 1          | 2             |
|------------|---------------|------------|---------------|------------|---------------|------------|---------------|------------|---------------|
| Angle      | Syn. Value    | Angle      | Syn. Value    | Angle      | Syn. Value    | Angle      | Syn. Value    | Angle      | Syn. Value    |
| °<br>0'000 | d<br>0'000000 | °<br>0'020 | d<br>0'000931 | °<br>0'040 | d<br>0'001862 | °<br>0'060 | d<br>0'002792 | °<br>0'080 | d<br>0'003723 |
| 1          | 47            | 21         | 977           | 41         | 1908          | 61         | 2839          | 81         | 3770          |
| 2          | 93            | 22         | 1024          | 42         | 1955          | 62         | 2885          | 82         | 3816          |
| 3          | 140           | 23         | 1070          | 43         | 2001          | 63         | 2932          | 83         | 3863          |
| 4          | 186           | 24         | 1117          | 44         | 2048          | 64         | 2978          | 84         | 3909          |
| 5          | 233           | 25         | 1163          | 45         | 2094          | 65         | 3025          | 85         | 3956          |
| 0'006      | 0'000279      | 0'026      | 0'001210      | 0'046      | 0'002141      | 0'066      | 0'003071      | 0'086      | 0'004002      |
| 7          | 326           | 27         | 1257          | 47         | 2187          | 67         | 3118          | 87         | 4049          |
| 8          | 372           | 28         | 1303          | 48         | 2234          | 68         | 3165          | 88         | 4095          |
| 9          | 419           | 29         | 1350          | 49         | 2280          | 69         | 3211          | 89         | 4142          |
| 10         | 465           | 30         | 1396          | 50         | 2327          | 70         | 3258          | 90         | 4188          |
| 0'011      | 0'000512      | 0'031      | 0'001443      | 0'051      | 0'002373      | 0'071      | 0'003304      | 0'091      | 0'004235      |
| 12         | 558           | 32         | 1489          | 52         | 2420          | 72         | 3351          | 92         | 4282          |
| 13         | 605           | 33         | 1536          | 53         | 2466          | 73         | 3397          | 93         | 4328          |
| 14         | 652           | 34         | 1582          | 54         | 2513          | 74         | 3444          | 94         | 4375          |
| 15         | 698           | 35         | 1629          | 55         | 2560          | 75         | 3490          | 95         | 4421          |
| 0'016      | 0'000745      | 0'036      | 0'001675      | 0'056      | 0'002606      | 0'076      | 0'003537      | 0'096      | 0'004468      |
| 17         | 791           | 37         | 1722          | 57         | 2653          | 77         | 3583          | 97         | 4514          |
| 18         | 838           | 38         | 1768          | 58         | 2699          | 78         | 3630          | 98         | 4561          |
| 19         | 884           | 39         | 1815          | 59         | 2746          | 79         | 3676          | 99         | 4607          |
| 0'020      | 0'000931      | 0'040      | 0'001862      | 0'060      | 0'002792      | 0'080      | 0'003723      | 0'100      | 0'004654      |

### XLI

| 1        | 2             |
|----------|---------------|
| Angle    | Syn. Value    |
| °<br>0'0 | d<br>0'000000 |
| ·1       | 4654          |
| ·2       | 9308          |
| ·3       | 13961         |
| ·4       | 18615         |
| ·5       | 23269         |
| 0'6      | 0'027923      |
| ·7       | 32576         |
| ·8       | 37230         |
| ·9       | 41884         |
| 1'0      | 0'046538      |

These Tables show the time occupied in describing any angle with the Mean Synodic Motion, and are to be used for converting into time the Complement, or excess of the longitude of Jupiter above that of the Satellite at the approximate time of conjunction given by Tables I-VIII.

To allow for the true Motion, increase the entry taken from column 2 by its product by the Variation as given by Tables XXVI-XXIX.

# SATELLITE IV

## Tables of the Phenomena

XLII

Correction of High Latitudes for Variation

| V    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | Var  |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|
| Lat  | 160 156 152    | 148 144 140    | 136 132 128    | 124 120 116    | 112 108 104    | 100 096 092    | 088 084 080    | Lat  |
| 0 50 | +770 +752 +733 | +714 +695 +677 | +658 +639 +6   | +60 +581 +563  | +544 +55 +505  | +486 +468 +449 | +429 +410 +390 | 0 50 |
| 52   | +7 +705 +687   | +669 +65 +634  | +617 +599 +581 | +564 +546 +59  | +510 +492 +475 | +456 +438 +421 | +402 +385 +367 | 52   |
| 54   | +674 +658 +641 | +65 +609 +59   | +576 +559 +543 | +56 +509 +493  | +477 +459 +443 | +426 +49 +393  | +376 +359 +343 | 54   |
| 56   | +65 +610 +595  | +580 +565 +549 | +533 +518 +503 | +488 +473 +457 | +44 +46 +410   | +395 +380 +364 | +349 +333 +318 | 56   |
| 58   | +575 +561 +547 | +533 +519 +55  | +491 +477 +464 | +449 +435 +41  | +406 +39 +379  | +364 +350 +336 | +321 +307 +29  | 58   |
| 60   | +54 +511 +499  | +486 +474 +461 | +448 +435 +4   | +410 +396 +384 | +371 +358 +345 | +33 +319 +306  | +293 +280 +266 | 60   |
| 0 62 | +47 +461 +45   | +439 +46 +415  | +404 +393 +38  | +369 +358 +347 | +334 +323 +311 | +300 +288 +276 | +265 +252 +241 | 0 62 |
| 64   | +420 +41 +40   | +389 +379 +369 | +360 +350 +339 | +39 +318 +308  | +298 +87 +77   | +66 +256 +45   | +35 +4 +15     | 64   |
| 66   | +367 +358 +349 | +340 +33 +323  | +313 +305 +96  | +287 +278 +7   | +26 +251 +4    | +33 +4 +15     | +206 +197 +187 | 66   |
| 68   | +31 +305 +97   | +90 +8 +74     | +67 +6 +252    | +45 +237 +9    | +2 +14 +07     | +199 +191 +183 | +175 +168 +160 | 68   |
| 70   | +57 +250 +44   | +38 +3 +226    | +2 +213 +08    | +01 +195 +188  | +183 +177 +170 | +163 +157 +151 | +145 +138 +131 | 70   |
| 0 72 | + +194 +190    | +186 +181 +176 | +171 +167 +161 | +157 +153 +147 | +14 +138 +13   | +18 +123 +118  | +113 +108 +103 | 0 72 |
| 74   | +14 +138 +135  | +131 +18 +15   | +12 +119 +115  | +11 +108 +105  | +10 +98 +95    | +91 +88 +84    | +80 +78 +74    | 74   |
| 76   | +8 +80 +78     | +77 +74 +73    | +71 +69 +67    | +65 +63 +61    | +60 +58 +55    | +54 +52 +49    | +48 +46 +43    | 76   |
| 78   | +0 +21 +2      | +0 +19 +       | +19 +18 +18    | +18 +18 +17    | +16 +17 +16    | +15 +15 +14    | +14 +13 +13    | 78   |
| 80   | -43 -41 -40    | -38 -38 -37    | -35 -34 -33    | -31 -30 -29    | -28 -27 -26    | -4 -3 -2       | -22 -20 -19    | 80   |
| 0 82 | -17 -104 -101  | -98 -96 -9     | -9 -87 -85     | -81 -79 -76    | -74 -70 -68    | -65 -63 -59    | -57 -54 -5     | 0 82 |
| 84   | -174 -169 -164 | -160 -156 -15  | -147 -14 -138  | -134 -19 -15   | -10 -116 -111  | -107 -103 -98  | -94 -90 -85    | 84   |
| 86   | -4 -236 -3     | -24 -17 -11    | -05 -199 -193  | -186 -18 -174  | -169 -163 -157 | -151 -144 -138 | -132 -16 -120  | 86   |
| 88   | -314 -35 -297  | -89 -8 -74     | -266 -258 -5   | -243 -34 -226  | -218 -211 -03  | -195 -187 -180 | -172 -164 -156 | 88   |
| 90   | -387 -376 -367 | -357 -347 -338 | -38 -318 -309  | -99 -89 -80    | -27 -260 -251  | -41 -23 -22    | -212 -203 -193 | 90   |
| 0 92 | -46 -45 -440   | -49 -417 -405  | -394 -382 -371 | -359 -347 -336 | -324 -313 -301 | -89 -278 -266  | -55 -244 -232  | 0 92 |
| 94   | -542 -529 -516 | -50 -489 -475  | -461 -448 -435 | -41 -408 -394  | -380 -367 -353 | -339 -37 -313  | -99 -286 -272  | 94   |
| 0 96 | -66 -610 -594  | -578 -563 -548 | -53 -517 -501  | -485 -470 -455 | -439 -423 -407 | 39 -377 -361   | -345 -330 -314 | 0 96 |

XLII continued

| V r  | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0    | - 0 - 0 - 0 | - 0 - 0 - 0 | Var  |
|------|----------------|----------------|----------------|----------------|----------------|-------------|-------------|------|
| Lat  | 080 076 072    | 068 064 060    | 056 052 048    | 044 040 036    | 032 028 024    | 020 016 012 | 008 004 000 | Lat  |
| 0 50 | +390 +37 +35   | +333 +313 +94  | +74 +256 +36   | +16 +197 +177  | +157 +138 +118 | +99 +79 +59 | +40 +20 0   | 0 50 |
| 52   | +367 +348 +331 | +31 +95 +75    | +257 +40 +1    | +3 +185 +166   | +148 +129 +111 | +93 +74 +56 | +37 +19 0   | 52   |
| 54   | +343 +35 +309  | +91 +275 +58   | +40 +24 +06    | +189 +173 +155 | +138 +121 +104 | +87 +69 +52 | +35 +17 0   | 54   |
| 56   | +318 +31 +86   | +70 +55 +239   | +3 +08 +191    | +175 +16 +144  | +18 +11 +97    | +81 +64 +48 | +3 +16 0    | 56   |
| 58   | +9 +78 +263    | +50 +35 +0     | +206 +191 +176 | +162 +148 +133 | +118 +103 +89  | +74 +59 +45 | +30 +15 0   | 58   |
| 60   | +266 +254 +4   | +8 +14 +21     | +188 +174 +161 | +148 +135 +121 | +107 +94 +81   | +68 +54 +41 | +7 +13 0    | 60   |
| 0 62 | +41 +9 +17     | +205 +193 +181 | +170 +157 +145 | +134 +12 +109  | +97 +85 +74    | +61 +49 +37 | +25 +12 0   | 0 62 |
| 64   | +15 +04 +194   | +183 +172 +16  | +151 +140 +19  | +119 +108 +97  | +86 +75 +66    | +55 +44 +33 | +22 +11 0   | 64   |
| 66   | +187 +178 +169 | +160 +150 +14  | +13 +1 +114    | +14 +95 +85    | +75 +67 +57    | +48 +38 +29 | +19 +10 0   | 66   |
| 68   | +160 +15 +144  | +136 +19 +11   | +113 +14 +97   | +89 +81 +73    | +64 +57 +49    | +41 +33 +5  | +16 +8 0    | 68   |
| 70   | +13 +16 +119   | +11 +16 +100   | +93 +86 +80    | +73 +67 +60    | +53 +47 +41    | +34 +27 +20 | +14 +7 0    | 70   |
| 0 72 | +103 +98 +93   | +88 +83 +78    | +7 +68 +63     | +58 +52 +47    | +42 +37 +3     | +27 +21 +16 | +11 +5 0    | 0 72 |
| 74   | +74 +70 +67    | +63 +59 +56    | +52 +49 +45    | +41 +37 +34    | +31 +7 +3      | +19 +15 +1  | +8 +4 0     | 74   |
| 76   | +43 +4 +40     | +37 +35 +33    | +31 +29 +7     | +5 +22 +0      | +19 +16 +14    | +12 +9 +7   | +5 +2 0     | 76   |
| 78   | +13 +1 +1      | +11 +10 +10    | +1 +9 +8       | +7 +7 +7       | +6 +5 +5       | +4 +3 +     | +2 +1 0     | 78   |
| 80   | -19 -18 -17    | -16 -15 -14    | -13 -11 -1     | -10 -9 -8      | -7 -6 -5       | -4 -3 -3    | -2 -1 0     | 80   |
| 0 82 | -5 -49 -47     | -43 -41 -38    | -36 -34 -31    | -8 -5 -22      | -20 -17 -15    | -12 -10 -7  | -5 -2 0     | 0 82 |
| 84   | -85 -81 -76    | -72 -68 -64    | -60 -55 -51    | -46 -42 -38    | -34 -29 -25    | -21 -17 -13 | -8 -4 0     | 84   |
| 86   | -10 -114 -108  | -10 -96 -90    | -84 -77 -7     | -66 -59 -54    | -48 -42 -36    | -30 -24 -18 | -12 -6 0    | 86   |
| 88   | -156 -49 -141  | -13 -14 -116   | -19 -11 -9     | -85 -78 -70    | -62 -54 -47    | -39 -31 -3  | -16 -8 0    | 88   |
| 90   | -193 -183 -174 | -164 -154 -145 | -135 -15 -116  | -106 -96 -87   | -77 -67 -58    | -48 -39 -29 | -19 -10 0   | 90   |
| 0 92 | -32 -1 -09     | -197 -186 -174 | -163 -151 -139 | -18 -116 -14   | -93 -81 -7     | -58 -46 -35 | -23 -12 0   | 0 92 |
| 94   | -27 -58 -245   | -31 -17 -04    | -191 -178 -164 | -150 -137 -123 | -109 -95 -8    | -68 -55 -41 | -27 -14 0   | 94   |
| 0 96 | -314 -99 -82   | -67 -252 -36   | -20 -4 -188    | -174 -158 -142 | -16 -111 -95   | -79 -63 -47 | -32 -16 0   | 0 96 |

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# SATELLITE IV

## Tables of the Phenomena

XLII continued

Correction of High Latitudes for Variation

| Var. | +0 +0 +0 |     |     | +0 +0 +0 |     |     | +0 +0 +0 |      |      | +0 +0 +0 |      |      | +0 +0 +0 |      |      | +0 +0 +0 |      |      | +0 +0 +0 |      |      | Var. |
|------|----------|-----|-----|----------|-----|-----|----------|------|------|----------|------|------|----------|------|------|----------|------|------|----------|------|------|------|
| Lat. | 000      | 004 | 008 | 012      | 016 | 020 | 024      | 028  | 032  | 036      | 040  | 044  | 048      | 052  | 056  | 060      | 064  | 068  | 072      | 076  | 080  | Lat. |
| 0.50 | 0        | -20 | -40 | -59      | -79 | -99 | -120     | -140 | -159 | -179     | -199 | -220 | -240     | -260 | -280 | -300     | -321 | -341 | -362     | -382 | -402 | 0.50 |
| .52  | 0        | -19 | -37 | -56      | -74 | -93 | -113     | -131 | -150 | -168     | -187 | -207 | -225     | -244 | -263 | -283     | -301 | -320 | -339     | -358 | -377 | .52  |
| .54  | 0        | -17 | -35 | -52      | -69 | -87 | -104     | -123 | -140 | -157     | -175 | -193 | -210     | -228 | -246 | -264     | -281 | -299 | -317     | -335 | -353 | .54  |
| .56  | 0        | -16 | -32 | -48      | -64 | -81 | -97      | -114 | -130 | -146     | -162 | -179 | -195     | -212 | -229 | -245     | -261 | -278 | -294     | -311 | -328 | .56  |
| .58  | 0        | -15 | -30 | -45      | -59 | -74 | -89      | -105 | -120 | -135     | -150 | -164 | -180     | -195 | -210 | -226     | -241 | -256 | -271     | -286 | -302 | .58  |
| .60  | 0        | -13 | -27 | -41      | -54 | -68 | -81      | -96  | -109 | -123     | -137 | -150 | -165     | -178 | -192 | -207     | -220 | -234 | -248     | -262 | -276 | .60  |
| 0.62 | 0        | -12 | -25 | -37      | -49 | -61 | -74      | -87  | -99  | -111     | -124 | -136 | -149     | -161 | -174 | -187     | -199 | -211 | -225     | -237 | -249 | 0.62 |
| .64  | 0        | -11 | -22 | -33      | -44 | -55 | -66      | -77  | -88  | -99      | -110 | -121 | -133     | -144 | -155 | -166     | -178 | -189 | -200     | -212 | -223 | .64  |
| .66  | 0        | -10 | -19 | -29      | -38 | -48 | -57      | -67  | -77  | -87      | -97  | -106 | -116     | -126 | -136 | -146     | -156 | -166 | -175     | -186 | -195 | .66  |
| .68  | 0        | -8  | -16 | -25      | -33 | -41 | -49      | -57  | -66  | -75      | -83  | -91  | -99      | -108 | -117 | -125     | -133 | -142 | -150     | -158 | -168 | .68  |
| .70  | 0        | -7  | -14 | -20      | -27 | -34 | -41      | -47  | -55  | -62      | -69  | -75  | -82      | -90  | -97  | -104     | -110 | -118 | -125     | -132 | -139 | .70  |
| 0.72 | 0        | -5  | -11 | -16      | -21 | -27 | -32      | -37  | -44  | -49      | -54  | -60  | -65      | -70  | -76  | -82      | -87  | -92  | -99      | -104 | -109 | 0.72 |
| .74  | 0        | -4  | -8  | -12      | -15 | -19 | -23      | -27  | -31  | -36      | -39  | -43  | -47      | -51  | -56  | -60      | -63  | -67  | -71      | -76  | -80  | .74  |
| .76  | 0        | -2  | -5  | -7       | -9  | -12 | -14      | -16  | -19  | -22      | -24  | -27  | -29      | -31  | -33  | -37      | -39  | -41  | -44      | -46  | -49  | .76  |
| .78  | 0        | -1  | -2  | -2       | -3  | -4  | -5       | -5   | -6   | -7       | -9   | -9   | -10      | -11  | -12  | -12      | -14  | -15  | -16      | -16  | -17  | .78  |
| .80  | 0        | +1  | +2  | +3       | +3  | +4  | +5       | +6   | +7   | +8       | +7   | +8   | +9       | +10  | +11  | +12      | +13  | +12  | +13      | +14  | +15  | .80  |
| 0.82 | 0        | +2  | +5  | +7       | +10 | +12 | +15      | +17  | +20  | +22      | +25  | +26  | +29      | +32  | +34  | +36      | +39  | +41  | +43      | +45  | +48  | 0.82 |
| .84  | 0        | +4  | +8  | +13      | +17 | +21 | +25      | +29  | +34  | +38      | +42  | +46  | +49      | +53  | +58  | +62      | +66  | +70  | +74      | +79  | +83  | .84  |
| .86  | 0        | +6  | +12 | +18      | +24 | +30 | +36      | +42  | +48  | +54      | +59  | +66  | +72      | +77  | +82  | +88      | +94  | +100 | +106     | +112 | +118 | .86  |
| .88  | 0        | +8  | +16 | +23      | +31 | +39 | +47      | +54  | +62  | +70      | +78  | +85  | +93      | +101 | +109 | +116     | +124 | +132 | +139     | +147 | +154 | .88  |
| .90  | 0        | +10 | +19 | +29      | +39 | +48 | +58      | +67  | +77  | +87      | +96  | +106 | +116     | +125 | +135 | +145     | +154 | +164 | +174     | +183 | +193 | .90  |
| 0.92 | 0        | +12 | +23 | +35      | +46 | +58 | +70      | +81  | +93  | +104     | +116 | +128 | +139     | +151 | +163 | +174     | +186 | +197 | +209     | +221 | +232 | 0.92 |
| .94  | 0        | +14 | +27 | +41      | +55 | +68 | +82      | +95  | +109 | +123     | +137 | +150 | +164     | +178 | +191 | +206     | +219 | +233 | +247     | +260 | +274 | .94  |
| 0.96 | 0        | +16 | +32 | +47      | +63 | +79 | +95      | +111 | +126 | +142     | +158 | +174 | +190     | +206 | +222 | +238     | +254 | +269 | +286     | +301 | +318 | 0.96 |

XLII continued

| Var. | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | Var. |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lat. | 080  | 084  | 088  | 092  | 096  | 100  | 104  | 108  | 112  | 116  | 120  | 124  | 128  | 132  | 136  | 140  | 144  | 148  | 152  | 156  | 160  | Lat. |
| 0.50 | -402 | -422 | -443 | -463 | -484 | -504 | -525 | -545 | -566 | -587 | -607 | -628 | -648 | -669 | -690 | -711 | -731 | -752 | -773 | -794 | -816 | 0.50 |
| .52  | -377 | -397 | -416 | -435 | -454 | -474 | -493 | -512 | -532 | -551 | -570 | -590 | -609 | -629 | -649 | -668 | -688 | -707 | -727 | -747 | -766 | .52  |
| .54  | -353 | -371 | -388 | -407 | -425 | -442 | -461 | -479 | -497 | -515 | -533 | -552 | -569 | -587 | -606 | -624 | -643 | -661 | -679 | -698 | -716 | .54  |
| .56  | -328 | -345 | -361 | -378 | -394 | -411 | -428 | -444 | -462 | -479 | -495 | -512 | -529 | -546 | -563 | -579 | -597 | -614 | -631 | -648 | -665 | .56  |
| .58  | -302 | -317 | -333 | -348 | -364 | -380 | -395 | -410 | -426 | -441 | -457 | -473 | -488 | -503 | -519 | -535 | -551 | -567 | -583 | -599 | -613 | .58  |
| .60  | -276 | -290 | -305 | -318 | -333 | -346 | -361 | -374 | -389 | -404 | -418 | -432 | -446 | -461 | -474 | -489 | -504 | -518 | -533 | -547 | -562 | .60  |
| 0.62 | -249 | -262 | -275 | -288 | -300 | -314 | -327 | -339 | -352 | -365 | -378 | -391 | -403 | -417 | -430 | -443 | -456 | -469 | -482 | -495 | -508 | 0.62 |
| .64  | -223 | -234 | -245 | -257 | -268 | -280 | -291 | -303 | -314 | -326 | -338 | -349 | -361 | -372 | -384 | -395 | -407 | -419 | -430 | -442 | -454 | .64  |
| .66  | -195 | -205 | -216 | -225 | -236 | -245 | -256 | -265 | -276 | -286 | -296 | -307 | -316 | -327 | -337 | -347 | -358 | -368 | -379 | -388 | -399 | .66  |
| .68  | -168 | -176 | -185 | -193 | -201 | -211 | -219 | -228 | -236 | -245 | -253 | -263 | -272 | -280 | -289 | -298 | -306 | -316 | -325 | -333 | -342 | .68  |
| .70  | -139 | -146 | -153 | -161 | -167 | -175 | -182 | -189 | -197 | -204 | -211 | -219 | -226 | -233 | -240 | -248 | -256 | -262 | -270 | -278 | -285 | .70  |
| 0.72 | -109 | -116 | -121 | -126 | -133 | -138 | -144 | -150 | -156 | -161 | -167 | -173 | -179 | -185 | -191 | -196 | -203 | -208 | -214 | -220 | -226 | 0.72 |
| .74  | -80  | -84  | -88  | -92  | -96  | -101 | -105 | -110 | -114 | -117 | -122 | -126 | -131 | -135 | -140 | -143 | -148 | -153 | -157 | -162 | -166 | .74  |
| .76  | -49  | -52  | -54  | -57  | -60  | -62  | -65  | -68  | -70  | -73  | -75  | -79  | -81  | -83  | -87  | -89  | -92  | -95  | -98  | -100 | -104 | .76  |
| .78  | -17  | -19  | -20  | -20  | -21  | -23  | -24  | -25  | -26  | -27  | -28  | -30  | -30  | -32  | -33  | -34  | -35  | -36  | -38  | -39  | -40  | .78  |
| .80  | +15  | +16  | +16  | +16  | +17  | +18  | +18  | +19  | +20  | +19  | +20  | +21  | +21  | +22  | +23  | +23  | +23  | +24  | +24  | +25  | +25  | .80  |
| 0.82 | +48  | +50  | +53  | +55  | +57  | +59  | +62  | +64  | +66  | +68  | +71  | +73  | +75  | +77  | +80  | +82  | +84  | +86  | +89  | +90  | +93  | 0.82 |
| .84  | +83  | +86  | +90  | +94  | +99  | +103 | +107 | +110 | +114 | +119 | +123 | +126 | +130 | +134 | +139 | +142 | +146 | +150 | +154 | +157 | +162 | .84  |
| .86  | +118 | +124 | +130 | +136 | +142 | +147 | +153 | +159 | +165 | +170 | +176 | +182 | +187 | +193 | +199 | +205 | +211 | +216 | +222 | +228 | +234 | .86  |
| .88  | +154 | +162 | +170 | +178 | +185 | +193 | +201 | +209 | +216 | +224 | +232 | +239 | +246 | +254 | +262 | +270 | +278 | +285 | +293 | +301 | +308 | .88  |
| .90  | +193 | +203 | +212 | +222 | +232 | +241 | +251 | +260 | +270 | +280 | +289 | +299 | +309 | +318 | +328 | +338 | +347 | +357 | +367 | +376 | +385 | .90  |
| 0.92 | +232 | +244 | +255 | +268 | +280 | +291 | +303 | +315 | +326 | +338 | +349 | +361 | +373 | +384 | +396 | +407 | +419 | +431 | +442 | +454 | +466 | 0.92 |
| .94  | +274 | +288 | +301 | +315 | +329 | +343 | +357 | +371 | +384 | +398 | +412 | +425 | +439 | +454 | +467 | +481 | +495 | +508 | +522 | +537 | +550 | .94  |
| 0.96 | +318 | +334 | +349 | +365 | +381 | +398 | +413 | +429 | +445 | +461 | +478 | +493 | +509 | +525 | +542 | +558 | +573 | +590 | +606 | +622 | +638 | 0.96 |

This Table is complementary to Table XLVI and supplies a correction to Latitude.

The unit equals 0.00001.

# SATELLITE IV

## Tables of the Phenomena

XLII *continued*

Correction of High Latitudes for Variation

| V    | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | Var  |
|------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------|
| Lat  | 160 156 152    | 148 144 140    | 136 132 128    | 124 120 116    | 112 108 104    | 100 096 092    | 088 084 080    | Lat  |
| 2 50 | -77 75 -733    | -714 -695 -677 | -658 -639 -60  | -60 -581 -563  | -544 -525 -505 | -486 -468 -449 | -429 -410 -39  | 2 50 |
| 48   | -7 -7 5 -687   | 669 -65 -634   | -617 -599 -581 | -564 546 59    | -51 -49 -475   | -456 -438 -41  | -40 -385 -367  | 48   |
| 46   | -674 -658 -641 | 65 -69 -59     | -576 -559 -543 | -56 -59 -493   | -477 -459 -443 | -46 -409 -393  | -376 -359 -343 | 46   |
| 44   | -65 -610 -595  | -580 565 -549  | -533 518 -503  | -488 -473 -457 | -44 -46 -41    | -395 -380 -364 | -349 -333 -318 | 44   |
| 42   | -575 -561 -541 | -533 -519 505  | -491 -477 -464 | -449 -435 -41  | -406 -39 -379  | -364 -350 -336 | -31 -307 -29   | 42   |
| 40   | -54 -51 -499   | -486 -474 461  | -448 -435 -4   | -410 -396 -384 | -371 -358 -345 | -332 -319 -36  | -293 -80 266   | 40   |
| 2 38 | 47 -161 -45    | -439 -46 415   | -44 -393 -381  | -369 -358 -347 | 334 -33 -311   | -30 -88 76     | -65 -252 -41   | 2 38 |
| 36   | -4 -41 -400    | -389 -379 -369 | -360 -350 -339 | 39 -318 -308   | -98 -87 -277   | -66 -56 -45    | -35 -24 -15    | 36   |
| 34   | -367 -358 -349 | -340 -332 -33  | -313 -35 -296  | -87 -78 -7     | -6 -51 -4      | 233 -4 -15     | -26 -197 -187  | 34   |
| 32   | -31 -35 -97    | -9 -82 -74     | -67 -60 -52    | -45 -37 29     | -214 -207      | -199 -191 -183 | -175 -168 -16  | 32   |
| 30   | -57 -50 -44    | -38 -3 -6      | -20 -213 -08   | -21 -195 -188  | -183 -177 -17  | -163 -157 -151 | -145 -138 -131 | 30   |
| 2 28 | -200 -194 -19  | -186 -181 -176 | -171 -167 -161 | -157 -153 147  | -142 -138 -132 | -118 -113 -118 | -113 -108 -103 | 2 28 |
| 26   | -14 -138 -135  | -13 -18 -15    | -12 -119 -115  | -11 -108 -105  | -10 -98 -95    | -91 -88 -84    | -80 -78 -74    | 26   |
| 24   | -8 -80 78      | -77 -74 -73    | -71 -69 -67    | -65 -63 -61    | -60 -58 -55    | -54 -5 -49     | -48 -46 -43    | 24   |
| 22   | -0 -1 -0       | -0 -19 -0      | -19 -18 -18    | -18 -18 -17    | -16 -17 -16    | -15 -15 -14    | -14 -13 -13    | 22   |
| 20   | +43 +41 +4     | +38 +38 +37    | +35 +34 +33    | +31 +30 +29    | +9 +7 +26      | +24 +23 +      | +2 +20 +19     | 20   |
| 2 18 | +17 +104 +1    | +98 +96 +9     | +90 +87 +85    | +81 +79 +76    | +74 +7 +68     | +65 +63 +59    | +57 +54 +52    | 2 18 |
| 16   | +174 +169 +164 | +160 +156 +15  | +147 +14 +138  | +134 +12 +115  | +110 +116 +111 | +107 +103 +98  | +94 +90 +85    | 16   |
| 14   | +4 +36 +3      | +4 +17 +11     | +05 +199 +103  | +186 +180 +174 | +169 +163 +157 | +151 +144 +138 | +13 +126 +120  | 14   |
| 12   | +314 +35 +97   | +89 +8 +74     | +66 +58 +250   | +243 +234 +226 | +18 +211 +203  | +195 +187 +180 | +17 +164 +156  | 12   |
| 10   | +387 +376 +367 | +357 +347 +338 | +38 +318 +309  | +299 +89 +80   | +270 +60 +251  | +241 +232 +22  | +212 +203 +193 | 10   |
| 2 08 | +462 +452 +44  | +49 +417 +405  | +394 +382 +371 | +359 +347 +336 | +324 +313 +301 | +289 +78 +266  | +255 +244 +232 | 2 08 |
| 06   | +54 +59 +516   | +502 +489 +475 | +461 +448 +435 | +41 +408 +394  | +380 +367 +353 | +339 +37 +313  | +299 +286 +272 | 06   |
| 2 04 | +66 +610 +594  | +578 +563 +548 | +53 +517 +501  | +485 +470 +455 | +439 +43 +407  | +392 +377 +361 | +345 +330 +314 | 2 04 |

XLII *continued*

| V r  | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0       | -0 -0 -0    | -0 -0 -0    | Var  |
|------|----------------|----------------|----------------|----------------|----------------|-------------|-------------|------|
| Lat  | 080 076 072    | 068 064 060    | 056 052 048    | 044 040 036    | 032 028 024    | 020 016 012 | 008 004 000 | Lat  |
| 2 50 | -39 37 -352    | -333 -313 -94  | -74 -56 -36    | -216 -197 -177 | -157 -138 -118 | -99 -79 -59 | -40 -20 0   | 2 50 |
| 48   | -36 -348 -331  | 31 -95 75      | -257 -40 -1    | -203 -185 -166 | -148 -129 -111 | -93 -74 -56 | -37 -19 0   | 48   |
| 46   | -343 -35 -39   | -91 -75 -58    | -40 -24 -06    | -189 -173 -155 | -138 -121 -104 | -87 -69 -52 | -35 -17 0   | 46   |
| 44   | -318 -301 -286 | -7 -55 -39     | -3 -28 -191    | -175 -160 -144 | -118 -112 -97  | -81 -64 -48 | -32 -16 0   | 44   |
| 42   | -9 -278 -63    | -50 -35 -0     | -06 -191 -176  | -162 -148 -133 | -118 -103 -89  | -74 -59 -45 | -30 -15 0   | 42   |
| 40   | -66 54 -24     | -8 -214 -01    | -188 -174 -161 | -148 -135 -11  | -107 -94 -81   | -68 -54 -41 | -27 -13 0   | 40   |
| 2 38 | -241 -9 -17    | -205 -193 -181 | -170 -157 -145 | -134 -12 -109  | -97 -85 -74    | -61 -49 -37 | -25 -12 0   | 2 38 |
| 36   | -215 -24 -194  | -183 -17 -16   | -151 -140 -129 | -119 -18 -97   | -86 -75 -66    | -55 -44 -33 | -22 -11 0   | 36   |
| 34   | -187 -178 -169 | -160 -150 -142 | -13 12 -114    | -14 -95 -85    | -75 -67 -57    | -48 -38 -9  | -19 -10 0   | 34   |
| 32   | -160 -152 -144 | -136 -19 -11   | -113 -104 -97  | -89 -81 -73    | -64 -57 -49    | -41 -33 -25 | -16 -8 0    | 32   |
| 30   | 131 -16 -119   | -112 -106 -100 | -93 -86 -80    | -73 -67 -60    | -53 -47 -41    | -34 -27 -20 | -14 -7 0    | 30   |
| 2 28 | -103 -98 -93   | -88 -83 -78    | -72 -68 -63    | -58 -52 -47    | -4 -37 -32     | -27 -21 -16 | -11 -5 0    | 2 28 |
| 26   | -74 -70 -67    | -63 -59 -56    | -5 -49 -45     | -41 -37 -34    | -31 -27 -3     | -19 -15 -12 | -8 -4 0     | 26   |
| 24   | -43 -42 -40    | -37 -35 -33    | -31 -29 -7     | -5 - -20       | -19 -16 -14    | -1 -9 -7    | -5 -2 0     | 24   |
| 22   | -13 -1 -1      | 11 -10 -       | -10 -9 -8      | -7 -7 -7       | -6 -5 -5       | 4 -3 -      | -2 -1 0     | 22   |
| 20   | +19 +18 +17    | +16 +15 +14    | +13 +11 +11    | +10 +9 +8      | +7 +6 +5       | +4 +3 +3    | +2 +1 0     | 20   |
| 2 18 | +52 +49 +47    | +43 +41 +38    | +36 +34 +31    | +28 +25 +2     | +0 +17 +15     | +1 +10 +7   | +5 + 0      | 2 18 |
| 16   | +85 +81 +76    | +72 +68 +64    | +60 +55 +51    | +46 +42 +38    | +34 +29 +5     | +1 +17 +13  | +8 +4 0     | 16   |
| 14   | +10 +114 +108  | +10 +96 +90    | +84 +77 +7     | +66 +59 +54    | +48 +4 +36     | +30 +24 +18 | +12 +6 0    | 14   |
| 12   | +156 +149 +141 | +132 +124 +116 | +109 +11 +9    | +85 +78 +70    | +6 +54 +47     | +39 +31 +3  | +16 +8 0    | 12   |
| 10   | +193 +183 +174 | +164 +154 +145 | +135 +15 +116  | +106 +96 +87   | +77 +67 +58    | +48 +39 +9  | +19 +10 0   | 10   |
| 2 08 | +23 +1 +209    | +197 +186 +174 | +163 +151 +139 | +118 +116 +14  | +93 +81 +7     | +58 +46 +35 | +3 +12 0    | 2 08 |
| 06   | +72 +258 +45   | +31 +17 +04    | +191 +178 +164 | +15 +137 +13   | +109 +95 +82   | +68 +55 +41 | +27 +14 0   | 06   |
| 2 04 | +314 +299 +8   | +67 +252 +236  | +0 +204 +188   | +174 +158 +142 | +116 +111 +95  | +79 +63 +47 | +3 +16 0    | 2 04 |

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# SATELLITE IV

## Tables of the Phenomena

XLII continued

Correction of High Latitude for Variation

| Var. | +0 +0 +0 |     |     | +0 +0 +0 |     |     | +0 +0 +0 |     |     | +0 +0 +0 |     |     | +0 +0 +0 |     |     | +0 +0 +0 |     |     | +0 +0 +0 |     |     | Var. |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |      |
|------|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|------|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|------|
| Lat. | 000      | 004 | 008 | 012      | 016 | 020 | 024      | 028 | 032 | 036      | 040 | 044 | 048      | 052 | 056 | 060      | 064 | 068 | 072      | 076 | 080 | Lat. |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |      |
| 2°50 | 0        | +   | 20  | +        | 40  | +   | 59       | +   | 79  | +        | 99  | +   | 120      | +   | 140 | +        | 159 | +   | 179      | +   | 199 | +    | 220 | + | 240 | + | 260 | + | 280 | + | 300 | + | 321 | + | 341 | + | 362 | + | 382 | + | 402 | 2°50 |
| 48   | 0        | +   | 19  | +        | 37  | +   | 56       | +   | 74  | +        | 93  | +   | 113      | +   | 131 | +        | 150 | +   | 168      | +   | 187 | +    | 207 | + | 225 | + | 244 | + | 263 | + | 283 | + | 301 | + | 320 | + | 339 | + | 358 | + | 377 | 48   |
| 46   | 0        | +   | 17  | +        | 35  | +   | 52       | +   | 69  | +        | 87  | +   | 104      | +   | 123 | +        | 140 | +   | 157      | +   | 175 | +    | 193 | + | 210 | + | 228 | + | 246 | + | 264 | + | 281 | + | 299 | + | 317 | + | 335 | + | 353 | 46   |
| 44   | 0        | +   | 16  | +        | 32  | +   | 48       | +   | 64  | +        | 81  | +   | 97       | +   | 114 | +        | 130 | +   | 146      | +   | 162 | +    | 179 | + | 195 | + | 212 | + | 229 | + | 245 | + | 261 | + | 278 | + | 294 | + | 311 | + | 328 | 44   |
| 42   | 0        | +   | 15  | +        | 30  | +   | 45       | +   | 59  | +        | 74  | +   | 89       | +   | 105 | +        | 120 | +   | 135      | +   | 150 | +    | 164 | + | 180 | + | 195 | + | 210 | + | 226 | + | 241 | + | 256 | + | 271 | + | 286 | + | 302 | 42   |
| 40   | 0        | +   | 13  | +        | 27  | +   | 41       | +   | 54  | +        | 68  | +   | 81       | +   | 96  | +        | 109 | +   | 123      | +   | 137 | +    | 150 | + | 165 | + | 178 | + | 192 | + | 207 | + | 220 | + | 234 | + | 248 | + | 262 | + | 276 | 40   |
| 2°38 | 0        | +   | 12  | +        | 25  | +   | 37       | +   | 49  | +        | 61  | +   | 74       | +   | 87  | +        | 99  | +   | 111      | +   | 124 | +    | 136 | + | 149 | + | 161 | + | 174 | + | 187 | + | 199 | + | 211 | + | 225 | + | 237 | + | 249 | 2°38 |
| 36   | 0        | +   | 11  | +        | 22  | +   | 33       | +   | 44  | +        | 55  | +   | 66       | +   | 77  | +        | 88  | +   | 99       | +   | 110 | +    | 121 | + | 133 | + | 144 | + | 155 | + | 166 | + | 178 | + | 189 | + | 200 | + | 212 | + | 223 | 36   |
| 34   | 0        | +   | 10  | +        | 19  | +   | 29       | +   | 38  | +        | 48  | +   | 57       | +   | 67  | +        | 77  | +   | 87       | +   | 97  | +    | 106 | + | 116 | + | 126 | + | 136 | + | 146 | + | 156 | + | 166 | + | 175 | + | 186 | + | 195 | 34   |
| 32   | 0        | +   | 8   | +        | 16  | +   | 25       | +   | 33  | +        | 41  | +   | 49       | +   | 57  | +        | 66  | +   | 75       | +   | 83  | +    | 91  | + | 99  | + | 108 | + | 117 | + | 125 | + | 133 | + | 142 | + | 150 | + | 158 | + | 168 | 32   |
| 30   | 0        | +   | 7   | +        | 14  | +   | 20       | +   | 27  | +        | 34  | +   | 41       | +   | 47  | +        | 55  | +   | 62       | +   | 69  | +    | 75  | + | 82  | + | 90  | + | 97  | + | 104 | + | 110 | + | 118 | + | 125 | + | 132 | + | 139 | 30   |
| 2°28 | 0        | +   | 5   | +        | 11  | +   | 16       | +   | 21  | +        | 27  | +   | 32       | +   | 37  | +        | 44  | +   | 49       | +   | 54  | +    | 60  | + | 65  | + | 70  | + | 76  | + | 82  | + | 87  | + | 92  | + | 99  | + | 104 | + | 109 | 2°28 |
| 26   | 0        | +   | 4   | +        | 8   | +   | 12       | +   | 15  | +        | 19  | +   | 23       | +   | 27  | +        | 31  | +   | 36       | +   | 39  | +    | 43  | + | 47  | + | 51  | + | 56  | + | 60  | + | 63  | + | 67  | + | 71  | + | 76  | + | 80  | 26   |
| 24   | 0        | +   | 2   | +        | 5   | +   | 7        | +   | 9   | +        | 12  | +   | 14       | +   | 16  | +        | 19  | +   | 22       | +   | 24  | +    | 27  | + | 29  | + | 31  | + | 33  | + | 37  | + | 39  | + | 41  | + | 44  | + | 46  | + | 49  | 24   |
| 22   | 0        | +   | 1   | +        | 2   | +   | 2        | +   | 3   | +        | 4   | +   | 5        | +   | 5   | +        | 6   | +   | 7        | +   | 9   | +    | 9   | + | 10  | + | 11  | + | 12  | + | 12  | + | 14  | + | 15  | + | 16  | + | 16  | + | 17  | 22   |
| 20   | 0        | -   | 1   | -        | 2   | -   | 3        | -   | 3   | -        | 4   | -   | 5        | -   | 6   | -        | 7   | -   | 8        | -   | 7   | -    | 8   | - | 9   | - | 10  | - | 11  | - | 12  | - | 13  | - | 12  | - | 13  | - | 14  | - | 15  | 20   |
| 2°18 | 0        | -   | 2   | -        | 5   | -   | 7        | -   | 10  | -        | 12  | -   | 15       | -   | 17  | -        | 20  | -   | 22       | -   | 25  | -    | 26  | - | 29  | - | 32  | - | 34  | - | 36  | - | 39  | - | 41  | - | 43  | - | 45  | - | 48  | 2°18 |
| 16   | 0        | -   | 4   | -        | 8   | -   | 13       | -   | 17  | -        | 21  | -   | 25       | -   | 29  | -        | 34  | -   | 38       | -   | 42  | -    | 46  | - | 49  | - | 53  | - | 58  | - | 62  | - | 66  | - | 70  | - | 74  | - | 79  | - | 83  | 16   |
| 14   | 0        | -   | 6   | -        | 12  | -   | 18       | -   | 24  | -        | 30  | -   | 36       | -   | 42  | -        | 48  | -   | 54       | -   | 59  | -    | 66  | - | 72  | - | 77  | - | 82  | - | 88  | - | 94  | - | 100 | - | 106 | - | 112 | - | 118 | 14   |
| 12   | 0        | -   | 8   | -        | 16  | -   | 23       | -   | 31  | -        | 39  | -   | 47       | -   | 54  | -        | 62  | -   | 70       | -   | 78  | -    | 85  | - | 93  | - | 101 | - | 109 | - | 116 | - | 124 | - | 132 | - | 139 | - | 147 | - | 154 | 12   |
| 10   | 0        | -   | 10  | -        | 19  | -   | 29       | -   | 39  | -        | 48  | -   | 58       | -   | 67  | -        | 77  | -   | 87       | -   | 96  | -    | 106 | - | 116 | - | 125 | - | 135 | - | 145 | - | 154 | - | 164 | - | 174 | - | 183 | - | 193 | 10   |
| 2°08 | 0        | -   | 12  | -        | 23  | -   | 35       | -   | 46  | -        | 58  | -   | 70       | -   | 81  | -        | 93  | -   | 104      | -   | 116 | -    | 128 | - | 139 | - | 151 | - | 163 | - | 174 | - | 186 | - | 197 | - | 209 | - | 221 | - | 232 | 2°08 |
| 06   | 0        | -   | 14  | -        | 27  | -   | 41       | -   | 55  | -        | 68  | -   | 82       | -   | 95  | -        | 109 | -   | 123      | -   | 137 | -    | 150 | - | 164 | - | 178 | - | 191 | - | 206 | - | 219 | - | 233 | - | 247 | - | 260 | - | 274 | 06   |
| 2°04 | 0        | -   | 16  | -        | 32  | -   | 47       | -   | 63  | -        | 79  | -   | 95       | -   | 111 | -        | 126 | -   | 142      | -   | 158 | -    | 174 | - | 190 | - | 206 | - | 222 | - | 238 | - | 254 | - | 269 | - | 286 | - | 301 | - | 318 | 2°04 |

XLII continued

| Var. | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | +0   | Var. |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lat. | 080  | 084  | 088  | 092  | 096  | 100  | 104  | 108  | 112  | 116  | 120  | 124  | 128  | 132  | 136  | 140  | 144  | 148  | 152  | 156  | 160  | Lat. |
| 2°50 | +402 | +422 | +443 | +463 | +484 | +504 | +525 | +545 | +566 | +587 | +607 | +628 | +648 | +669 | +690 | +711 | +731 | +752 | +773 | +794 | +816 | 2°50 |
| 48   | +377 | +397 | +416 | +435 | +454 | +474 | +493 | +512 | +532 | +551 | +570 | +590 | +609 | +629 | +649 | +668 | +688 | +707 | +727 | +747 | +766 | 48   |
| 46   | +353 | +371 | +388 | +407 | +425 | +442 | +461 | +479 | +497 | +515 | +533 | +552 | +569 | +587 | +606 | +624 | +643 | +661 | +679 | +698 | +716 | 46   |
| 44   | +328 | +345 | +361 | +378 | +394 | +411 | +428 | +444 | +462 | +479 | +495 | +512 | +529 | +546 | +563 | +579 | +597 | +614 | +631 | +648 | +665 | 44   |
| 42   | +302 | +317 | +333 | +348 | +364 | +380 | +395 | +410 | +426 | +441 | +457 | +473 | +488 | +503 | +519 | +535 | +551 | +567 | +583 | +599 | +613 | 42   |
| 40   | +276 | +290 | +305 | +318 | +333 | +346 | +361 | +374 | +389 | +404 | +418 | +432 | +446 | +461 | +474 | +489 | +504 | +518 | +533 | +547 | +562 | 40   |
| 2°38 | +249 | +262 | +275 | +288 | +300 | +314 | +327 | +339 | +352 | +365 | +378 | +391 | +403 | +417 | +430 | +443 | +456 | +469 | +482 | +495 | +508 | 2°38 |
| 36   | +223 | +234 | +245 | +257 | +268 | +280 | +291 | +303 | +314 | +326 | +338 | +349 | +361 | +372 | +384 | +395 | +407 | +419 | +430 | +442 | +454 | 36   |
| 34   | +195 | +205 | +216 | +225 | +236 | +245 | +256 | +265 | +276 | +286 | +296 | +307 | +316 | +327 | +337 | +347 | +358 | +368 | +379 | +388 | +399 | 34   |
| 32   | +168 | +176 | +185 | +193 | +201 | +211 | +219 | +228 | +236 | +245 | +253 | +263 | +272 | +280 | +289 | +298 | +306 | +316 | +325 | +333 | +342 | 32   |
| 30   | +139 | +146 | +153 | +161 | +167 | +175 | +182 | +189 | +197 | +204 | +211 | +219 | +226 | +233 | +240 | +248 | +256 | +262 | +270 | +278 | +285 | 30   |
| 2°28 | +109 | +116 | +121 | +126 | +133 | +138 | +144 | +150 | +156 | +161 | +167 | +173 | +179 | +185 | +191 | +196 | +203 | +208 | +214 | +220 | +226 | 2°28 |
| 26   | +80  | +84  | +88  | +92  | +96  | +101 | +105 | +110 | +114 | +117 | +122 | +126 | +131 | +135 | +140 | +143 | +148 | +153 | +157 | +162 | +166 | 26   |
| 24   | +49  | +52  | +54  | +57  | +60  | +62  | +65  | +68  | +70  | +73  | +75  | +79  | +81  | +83  | +87  | +89  | +92  | +95  | +98  | +100 | +104 | 24   |
| 22   | +17  | +19  | +20  | +20  | +21  | +23  | +24  | +25  | +26  | +27  | +28  | +30  | +30  | +32  | +33  | +34  | +35  | +36  | +38  | +39  | +40  | 22   |
| 20   | -15  | -16  | -16  | -16  | -17  | -18  | -18  | -19  | -20  | -19  | -20  | -21  | -21  | -22  | -23  | -23  | -23  | -24  | -24  | -25  | -25  | 20   |
| 2°18 | -48  | -50  | -53  | -55  | -57  | -59  | -62  | -64  | -66  | -68  | -71  | -73  | -75  | -77  | -80  | -82  | -84  | -86  | -89  | -90  | -93  | 2°18 |
| 16   | -83  | -86  | -90  | -94  | -99  | -103 | -107 | -110 | -114 | -119 | -123 | -126 | -130 | -134 | -139 | -142 | -146 | -150 | -154 | -157 | -162 | 16   |
| 14   | -118 | -124 | -130 | -136 | -142 | -147 | -153 | -159 | -165 | -170 | -176 | -182 | -187 | -193 | -199 | -205 | -211 | -216 | -222 | -228 | -234 | 14   |
| 12   | -154 | -162 | -170 | -178 | -185 | -193 | -201 | -209 | -216 | -224 | -232 | -239 | -246 | -254 | -262 | -270 | -278 | -285 | -293 | -301 | -308 | 12   |
| 10   | -193 | -203 | -212 | -222 | -232 | -241 | -251 | -260 | -270 | -280 | -289 | -299 | -309 | -318 | -328 | -338 | -347 | -357 | -367 | -376 | -385 | 10   |
| 2°08 | -232 | -244 | -255 | -268 | -280 | -291 | -303 | -315 | -326 | -338 | -349 | -361 | -373 | -384 | -396 | -407 | -419 | -431 | -442 | -454 | -466 | 2°08 |
| 06   | -274 | -288 | -301 | -315 | -329 | -343 | -357 | -371 | -384 | -398 | -412 | -425 | -439 | -454 | -467 | -481 | -495 | -508 | -522 | -537 | -550 | 06   |
| 2°04 | -318 | -334 | -349 | -365 | -381 | -398 | -413 | -429 | -445 | -461 | -478 | -493 | -509 | -525 | -542 | -558 | -573 | -590 | -606 | -622 | -638 | 2°04 |

This Table is complementary to Table XLVI and supplies a correction to Latitude.

The unit equals 0.00001.

# SATELLITE IV

## Tables of the Phenomena

XLIII

Correction of High Latitudes

Ecl, Oc

| <b>J</b><br><b>M</b> | <b>0<sup>d</sup></b> | <b>1<sup>d</sup></b> | <b>2<sup>d</sup></b> | <b>3<sup>d</sup></b> | <b>4<sup>d</sup></b> | <b>5<sup>d</sup></b> | <b>6<sup>l</sup></b> | <b>7<sup>d</sup></b> | <b>8<sup>d</sup></b> | <b>9<sup>d</sup></b> | <b>10<sup>d</sup></b> | <b>11<sup>d</sup></b> | <b>12<sup>d</sup></b> | <b>13<sup>d</sup></b> | <b>14<sup>d</sup></b> | <b>15<sup>d</sup></b> | <b>16<sup>d</sup></b> | <b>17<sup>l</sup></b> | <b>18<sup>l</sup></b> | <b>19<sup>d</sup></b> | <b>20<sup>d</sup></b> |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>08</b>            |                      |                      | -44                  | -44                  | -43                  | -40                  | -37                  |                      |                      | *                    |                       | *                     |                       | *                     |                       | *                     | *                     |                       | *                     | -45                   | -44                   |
| <b>10</b>            | -48                  | -51                  | -52                  | -52                  | -50                  | -47                  | -43                  | -38                  | -3                   | *                    | *                     |                       | *                     | *                     |                       | *                     | *                     | -49                   | -52                   | -52                   | -51                   |
| <b>12</b>            | -55                  | -58                  | -59                  | -58                  | -56                  | -52                  | -47                  | -4                   | -35                  | -31                  | -6                    | *                     | *                     |                       | *                     | -45                   | -52                   | -55                   | -58                   | -59                   | -57                   |
| <b>14</b>            | -60                  | -6                   | -63                  | -62                  | -59                  | -55                  | -50                  | -45                  | -39                  | -33                  | -9                    | -8                    | -30                   | -35                   | -43                   | -50                   | -56                   | -61                   | -63                   | -63                   | -61                   |
| <b>16</b>            | -63                  | -66                  | -66                  | -65                  | -6                   | -58                  | -53                  | -47                  | -41                  | -36                  | -32                   | 31                    | -34                   | -39                   | -46                   | -54                   | -60                   | -64                   | -66                   | -66                   | -64                   |
| <b>18</b>            | -65                  | -68                  | -68                  | -67                  | -63                  | -59                  | -54                  | -48                  | 4                    | -37                  | -33                   | -33                   | -36                   | -41                   | -48                   | -56                   | -6                    | -66                   | -68                   | -68                   | -66                   |
| <b>20</b>            | -66                  | -69                  | -69                  | -67                  | -64                  | -59                  | -54                  | -48                  | -4                   | -37                  | -34                   | -34                   | -37                   | -42                   | -49                   | -57                   | -63                   | -67                   | -69                   | -68                   | -66                   |
| <b>22</b>            | -65                  | -67                  | -68                  | *                    |                      | *                    | -5                   | -46                  | -41                  | -36                  | -33                   | -33                   | -36                   | -42                   | -49                   | -56                   | -62                   | -66                   | -67                   | -67                   | *                     |
| <b>24</b>            | -63                  |                      |                      |                      |                      |                      | *                    | *                    | -40                  | -35                  | -33                   | -3                    | -35                   | -41                   | -48                   | -54                   | -60                   | -64                   | *                     | *                     | *                     |
| <b>26</b>            | *                    |                      |                      | *                    | *                    |                      | *                    | *                    |                      | -33                  | -31                   | -31                   | -33                   | -39                   | -45                   | -51                   | -57                   | *                     | *                     | *                     | *                     |
| <b>28</b>            | *                    |                      |                      | *                    |                      |                      | *                    | *                    | *                    |                      | -9                    | -9                    | -31                   | -36                   | -42                   | -48                   | *                     | *                     | *                     | *                     | *                     |
| <b>56</b>            |                      |                      |                      | *                    | *                    | *                    |                      | *                    |                      | *                    | -51                   | -45                   | -38                   | -33                   | -31                   | -31                   | *                     | *                     | *                     | *                     | *                     |
| <b>58</b>            | *                    |                      |                      | *                    |                      | *                    |                      | *                    |                      | -58                  | -53                   | -46                   | -40                   | -34                   | -3                    | -32                   | -34                   | *                     | *                     | *                     | *                     |
| <b>60</b>            | -38                  | -44                  |                      |                      | *                    |                      |                      | *                    | -66                  | -61                  | -55                   | -48                   | -42                   | -36                   | -33                   | -33                   | -35                   | -40                   | -45                   | *                     | *                     |
| <b>62</b>            | -39                  | -45                  | -51                  | *                    |                      | *                    | *                    | -68                  | -65                  | -6                   | -56                   | -49                   | -4                    | -37                   | -34                   | -34                   | -36                   | -41                   | -47                   | *                     | *                     |
| <b>64</b>            | -40                  | -46                  | -5                   | -57                  | 62                   | -66                  | -68                  | -69                  | -67                  | -63                  | -57                   | -50                   | -42                   | -37                   | -34                   | -34                   | -37                   | -42                   | -47                   | -54                   | -59                   |
| <b>66</b>            | -40                  | -46                  | -5                   | -57                  | -6                   | -66                  | -68                  | -68                  | -66                  | -62                  | -56                   | -48                   | -41                   | -35                   | -33                   | -33                   | -37                   | -4                    | -48                   | -54                   | -59                   |
| <b>68</b>            | -39                  | -45                  | -51                  | -56                  | -60                  | -64                  | -66                  | -66                  | -63                  | -59                  | -53                   | -46                   | -38                   | -33                   | -31                   | -32                   | -35                   | -41                   | -46                   | -52                   | -58                   |
| <b>70</b>            | -37                  | -42                  | -48                  | -53                  | -57                  | -60                  | -62                  | -62                  | -60                  | -56                  | -50                   | -42                   | -35                   | -30                   | -28                   | -29                   | -33                   | -38                   | -44                   | -50                   | -54                   |
| <b>72</b>            | -33                  | -39                  | -44                  | -49                  | -53                  | -55                  | -57                  | -56                  | -54                  | -50                  | -44                   | *                     | *                     | *                     |                       | -25                   | -29                   | -35                   | -41                   | -46                   | -50                   |
| <b>74</b>            | -9                   | -35                  | -4                   | -44                  | -47                  | -49                  | -50                  | -49                  | -48                  | *                    |                       | *                     | *                     | *                     | *                     |                       | *                     | 31                    | -37                   | -41                   | -45                   |
| <b>76</b>            |                      | *                    | -34                  | -38                  | -41                  | -42                  | -4                   | -42                  | *                    |                      | *                     | *                     | *                     | *                     | *                     | *                     | *                     | *                     | *                     | -36                   | -39                   |
| <b>92</b>            |                      |                      | *                    | *                    | *                    |                      | *                    | *                    |                      | +45                  | +47                   | +47                   | +46                   | +44                   | +41                   | +36                   | +31                   | *                     | *                     | *                     | *                     |
| <b>94</b>            | +31                  | +5                   |                      |                      | *                    | *                    |                      | *                    | +49                  | +52                  | +54                   | +54                   | +52                   | +50                   | +46                   | +41                   | +35                   | +29                   | +24                   | *                     | *                     |
| <b>96</b>            | +34                  | +9                   | +6                   | +25                  | +8                   | +26                  | +41                  | +48                  | +54                  | +57                  | +59                   | +59                   | +57                   | +54                   | +49                   | +44                   | +38                   | +33                   | +8                    | +5                    | +25                   |
| <b>98</b>            | +38                  | +3                   | +30                  | +9                   | +33                  | +39                  | +46                  | +53                  | +59                  | +63                  | +64                   | +63                   | +61                   | +58                   | +53                   | +48                   | +4                    | +36                   | +31                   | +29                   | +30                   |
| <b>100</b>           | +40                  | +35                  | +32                  | +33                  | +36                  | +43                  | +50                  | +57                  | +63                  | +66                  | +67                   | +67                   | +64                   | +60                   | +55                   | +50                   | +44                   | +38                   | +34                   | +32                   | +33                   |
| <b>102</b>           | +41                  | +39                  | +36                  | +36                  | +39                  | +45                  | +52                  | +58                  | +64                  | +67                  | +68                   | +68                   | +66                   | +62                   | +58                   | +5                    | +47                   | +41                   | +38                   | +36                   | +37                   |
| <b>104</b>           | +40                  | +36                  | +34                  | +35                  | +39                  | +45                  | +52                  | +59                  | +64                  | +68                  | +69                   | +68                   | +65                   | +61                   | +55                   | +49                   | +44                   | +38                   | +35                   | +34                   | +36                   |
| <b>106</b>           | +39                  | +35                  | +33                  | +34                  | +38                  | +44                  | +51                  | +58                  | +63                  | +66                  | +67                   | *                     | *                     | *                     | *                     | +48                   | +43                   | +38                   | +34                   | +33                   | +35                   |
| <b>108</b>           | +38                  | +33                  | +32                  | +33                  | +37                  | +4                   | +49                  | +56                  | +61                  | +64                  | *                     | *                     | *                     | *                     | *                     | *                     | +41                   | +36                   | +33                   | +32                   | +34                   |
| <b>110</b>           | *                    | +31                  | +30                  | +31                  | +34                  | +40                  | +47                  | +53                  | *                    | *                    | *                     | *                     | *                     | *                     | *                     | *                     | *                     | +34                   | +31                   | +30                   | +32                   |
| <b>112</b>           |                      |                      | +8                   | +9                   | +32                  | +37                  | +43                  | *                    |                      | *                    | *                     | *                     | *                     | *                     | *                     | *                     | *                     | *                     | +29                   | +28                   | +30                   |
| <b>138</b>           |                      |                      | +45                  | +39                  | +33                  | +29                  | +28                  | *                    | *                    |                      | *                     |                       | *                     | *                     | *                     |                       | *                     | *                     |                       | +43                   | +37                   |
| <b>140</b>           |                      | +54                  | +48                  | +42                  | +36                  | +3                   | +30                  | +31                  | *                    | *                    | *                     |                       | *                     | *                     |                       | *                     | *                     |                       | +52                   | +46                   | +40                   |
| <b>142</b>           | +62                  | +57                  | +51                  | +44                  | +38                  | +34                  | +32                  | +32                  | +35                  | +40                  | *                     |                       | *                     | *                     |                       | *                     |                       | +61                   | +56                   | +49                   | +4                    |
| <b>144</b>           | +64                  | +60                  | +53                  | +46                  | +40                  | +35                  | +3                   | +34                  | +37                  | +42                  | +47                   | *                     | *                     | *                     | *                     | +67                   | +66                   | +63                   | +58                   | +51                   | +44                   |
| <b>146</b>           | +65                  | +61                  | +54                  | +47                  | +40                  | +35                  | +33                  | +34                  | +38                  | +43                  | +49                   | +55                   | +60                   | +65                   | +67                   | +69                   | +68                   | +64                   | +59                   | +52                   | +45                   |
| <b>148</b>           | +66                  | +61                  | +54                  | +47                  | +40                  | +35                  | +34                  | +35                  | +38                  | +44                  | +50                   | +56                   | +61                   | +65                   | +68                   | +69                   | +68                   | +64                   | +59                   | +5                    | +44                   |
| <b>150</b>           | +64                  | +59                  | +53                  | +45                  | +38                  | +33                  | +3                   | +33                  | +38                  | +43                  | +49                   | +55                   | +60                   | +64                   | +6                    | +68                   | +66                   | +63                   | +57                   | +50                   | +43                   |
| <b>152</b>           | +6                   | +57                  | +5                   | +43                  | +35                  | +31                  | +30                  | +32                  | +36                  | +4                   | +48                   | +53                   | +58                   | +62                   | +64                   | +65                   | +64                   | +60                   | +55                   | +48                   | +40                   |
| <b>154</b>           | +57                  | +5                   | +45                  | +38                  | +31                  | +27                  | +27                  | +29                  | +34                  | +40                  | +46                   | +51                   | +55                   | +59                   | +60                   | +61                   | +6                    | +56                   | +50                   | +43                   | +36                   |
| <b>156</b>           | +51                  | +46                  |                      | *                    |                      | *                    |                      | +25                  | +31                  | +36                  | +42                   | +47                   | +51                   | +53                   | +55                   | +55                   | +53                   | +50                   | *                     | *                     | *                     |
| <b>158</b>           | *                    |                      |                      | *                    | *                    | *                    |                      | *                    | *                    | +32                  | +37                   | +41                   | +45                   | +47                   | +48                   | +48                   | +46                   | *                     | *                     | *                     | *                     |
| <b>176</b>           |                      |                      | 49                   | -48                  | -49                  | -44                  | -40                  | *                    | *                    |                      | *                     |                       | *                     | *                     | *                     |                       | *                     |                       | *                     | -49                   | -48                   |
| <b>178</b>           | -52                  | -55                  | -56                  | -55                  | -53                  | -50                  | -45                  | -40                  | -34                  | *                    |                       | *                     | *                     | *                     |                       |                       |                       | -52                   | -55                   | -56                   | -54                   |
| <b>180</b>           | -58                  | -61                  | -62                  | -59                  | -58                  | -53                  | -48                  | -44                  | -37                  | -32                  | -28                   |                       | *                     | *                     |                       | -48                   | -54                   | -58                   | -61                   | -61                   | -63                   |

N t th b ppl d Th it q l ooo Thi T bl i m plm t y to T bl XLVII Wh th L tit d d i d f m T bl  
 XXX-XXXVIII b tw d 95 b tw 5 d it ppl q t whi h m t b ppl d to it b f it i d gum t f T bl XLV

# SATELLITE IV

## Tables of the Phenomena

XLIV

Correction of High Latitudes

Sh., Tr.

| $\begin{smallmatrix} M \\ J \end{smallmatrix}$ | 0 <sup>d</sup> | 1 <sup>d</sup> | 2 <sup>d</sup> | 3 <sup>d</sup> | 4 <sup>d</sup> | 5 <sup>d</sup> | 6 <sup>d</sup> | 7 <sup>d</sup> | 8 <sup>d</sup> | 9 <sup>d</sup> | 10 <sup>d</sup> | 11 <sup>d</sup> | 12 <sup>d</sup> | 13 <sup>d</sup> | 14 <sup>d</sup> | 15 <sup>d</sup> | 16 <sup>d</sup> | 17 <sup>d</sup> | 18 <sup>d</sup> | 19 <sup>d</sup> | 20 <sup>d</sup> |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0 <sup>8</sup>                                 | *              | *              | +15            | +7             | 0              | +7             | +13            | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | +11             | +6              |
| 1 <sup>0</sup>                                 | +9             | -3             | -11            | -16            | -17            | -15            | -9             | 0              | +12            | *              | *               | *               | *               | *               | *               | *               | *               | +5              | -6              | -13             | -16             |
| 1 <sup>2</sup>                                 | -15            | -25            | -31            | -34            | -34            | -31            | -24            | -16            | -5             | +5             | +16             | *               | *               | *               | *               | +6              | -8              | -18             | -27             | -33             | -34             |
| 1 <sup>4</sup>                                 | -33            | -40            | -46            | -47            | -45            | -41            | -36            | -28            | -19            | -8             | 0               | +6              | +8              | +4              | -5              | -15             | -26             | -36             | -43             | -46             | -47             |
| 1 <sup>6</sup>                                 | -46            | -52            | -56            | -57            | -55            | -51            | -45            | -37            | -28            | -20            | -12             | -8              | -8              | -12             | -20             | -30             | -40             | -48             | -54             | -57             | -57             |
| 1 <sup>8</sup>                                 | -55            | -61            | -64            | -64            | -61            | -57            | -51            | -43            | -35            | -27            | -21             | -18             | -19             | -22             | -32             | -41             | -50             | -57             | -62             | -64             | -64             |
| 2 <sup>0</sup>                                 | -61            | -67            | -69            | -68            | -65            | -60            | -54            | -47            | -39            | -32            | -27             | -25             | -26             | -31             | -40             | -48             | -56             | -63             | -67             | -68             | -67             |
| 2 <sup>2</sup>                                 | -64            | -68            | -70            | *              | *              | *              | -54            | -47            | -41            | -34            | -29             | -28             | -30             | -36             | -43             | -52             | -60             | -65             | -68             | -70             | *               |
| 2 <sup>4</sup>                                 | -64            | *              | *              | *              | *              | *              | *              | *              | -41            | -35            | -32             | -30             | -32             | -38             | -46             | -52             | -60             | -66             | *               | *               | *               |
| 2 <sup>6</sup>                                 | *              | *              | *              | *              | *              | *              | *              | *              | *              | -34            | -31             | -31             | -32             | -38             | -44             | -51             | -58             | *               | *               | *               | *               |
| 2 <sup>8</sup>                                 | *              | *              | *              | *              | *              | *              | *              | *              | *              | *              | -30             | -30             | -31             | -36             | -43             | -49             | *               | *               | *               | *               | *               |
| 5 <sup>6</sup>                                 | *              | *              | *              | *              | *              | *              | *              | *              | *              | *              | -52             | -45             | -38             | -33             | -31             | -32             | *               | *               | *               | *               | *               |
| 5 <sup>8</sup>                                 | *              | *              | *              | *              | *              | *              | *              | *              | *              | -59            | -53             | -45             | -39             | -33             | -31             | -32             | -35             | *               | *               | *               | *               |
| 6 <sup>0</sup>                                 | -38            | -46            | *              | *              | *              | *              | *              | *              | -67            | -60            | -53             | -45             | -38             | -32             | -30             | -31             | -35             | -41             | -47             | *               | *               |
| 6 <sup>2</sup>                                 | -41            | -45            | -52            | *              | *              | *              | *              | -69            | -64            | -59            | -51             | -42             | -35             | -30             | -28             | -29             | -33             | -40             | -47             | *               | *               |
| 6 <sup>4</sup>                                 | -33            | -43            | -51            | -57            | -62            | -66            | -67            | -66            | -62            | -55            | -47             | -38             | -29             | -25             | -23             | -25             | -31             | -38             | -45             | -54             | -60             |
| 6 <sup>6</sup>                                 | -31            | -39            | -47            | -53            | -60            | -62            | -63            | -60            | -55            | -48            | -39             | -29             | -21             | -16             | -16             | -19             | -26             | -33             | -42             | -50             | -55             |
| 6 <sup>8</sup>                                 | -23            | -32            | -41            | -47            | -52            | -55            | -55            | -52            | -45            | -44            | -27             | -17             | -8              | -4              | -7              | -10             | -17             | -26             | -34             | -42             | -50             |
| 7 <sup>0</sup>                                 | -13            | -22            | -31            | -37            | -42            | -44            | -43            | -37            | -32            | -22            | -11             | 0               | +8              | +12             | +10             | +4              | -6              | -15             | -25             | -33             | -39             |
| 7 <sup>2</sup>                                 | +3             | -9             | -17            | -24            | -29            | -29            | -28            | -21            | -13            | -1             | +12             | *               | *               | *               | *               | +22             | +11             | -1              | -12             | -20             | -24             |
| 7 <sup>4</sup>                                 | +23            | +9             | -1             | -7             | -11            | -11            | -7             | -1             | +12            | *              | *               | *               | *               | *               | *               | *               | *               | +18             | +5              | -3              | -9              |
| 7 <sup>6</sup>                                 | *              | *              | +23            | +15            | +11            | +14            | +20            | +15            | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | +19             | +14             |
| 9 <sup>2</sup>                                 | *              | *              | *              | *              | *              | *              | *              | *              | *              | -22            | -10             | -2              | +1              | +1              | -3              | -13             | -24             | *               | *               | *               | *               |
| 9 <sup>4</sup>                                 | -11            | -25            | *              | *              | *              | *              | *              | *              | -5             | +6             | +15             | +21             | +22             | +21             | +16             | +8              | -3              | -15             | -19             | *               | *               |
| 9 <sup>6</sup>                                 | +5             | -5             | -15            | -21            | -22            | -15            | -8             | +4             | +16            | +26            | +33             | +37             | +37             | +35             | +29             | +22             | +12             | +3              | -8              | -18             | -22             |
| 9 <sup>8</sup>                                 | +19            | +9             | +2             | -3             | -2             | +4             | +12            | +23            | +33            | +42            | +47             | +50             | +49             | +47             | +41             | +34             | +25             | +16             | +6              | 0               | -3              |
| 10 <sup>0</sup>                                | +28            | +20            | +14            | +12            | +13            | +19            | +27            | +37            | +47            | +54            | +58             | +60             | +59             | +55             | +49             | +42             | +34             | +25             | +18             | +13             | +12             |
| 10 <sup>2</sup>                                | +34            | +30            | +24            | +22            | +24            | +29            | +37            | +46            | +55            | +61            | +64             | +66             | +65             | +61             | +56             | +49             | +42             | +34             | +28             | +24             | +23             |
| 10 <sup>4</sup>                                | +38            | +31            | +27            | +27            | +29            | +35            | +43            | +52            | +59            | +66            | +69             | +69             | +67             | +63             | +56             | +49             | +42             | +35             | +29             | +27             | +27             |
| 10 <sup>6</sup>                                | +39            | +33            | +30            | +30            | +33            | +39            | +47            | +55            | +62            | +67            | +69             | *               | *               | *               | *               | +50             | +44             | +37             | +32             | +29             | +30             |
| 10 <sup>8</sup>                                | +39            | +33            | +31            | +31            | +35            | +40            | +47            | +56            | +62            | +67            | *               | *               | *               | *               | *               | *               | +43             | +37             | +33             | +31             | +32             |
| 11 <sup>0</sup>                                | *              | +33            | +30            | +31            | +33            | +40            | +47            | +54            | *              | *              | *               | *               | *               | *               | *               | *               | *               | +36             | +32             | +30             | +32             |
| 11 <sup>2</sup>                                | *              | *              | +29            | +30            | +32            | +38            | +44            | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | +30             | +32             | +31             |
| 13 <sup>8</sup>                                | *              | *              | +46            | +40            | +34            | +30            | +29            | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | +44             | +38             |
| 14 <sup>0</sup>                                | *              | +56            | +49            | +41            | +36            | +32            | +30            | +30            | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | +53             | +46             | +40             |
| 14 <sup>2</sup>                                | +64            | +57            | +50            | +42            | +36            | +32            | +31            | +32            | +34            | +42            | *               | *               | *               | *               | *               | *               | *               | +62             | +56             | +48             | +40             |
| 14 <sup>4</sup>                                | +64            | +58            | +49            | +41            | +35            | +31            | +29            | +32            | +36            | +43            | +49             | *               | *               | *               | *               | +70             | +67             | +62             | +56             | +47             | +39             |
| 14 <sup>6</sup>                                | +62            | +56            | +47            | +39            | +31            | +27            | +26            | +29            | +35            | +42            | +49             | +56             | +62             | +68             | +69             | +69             | +66             | +60             | +53             | +44             | +36             |
| 14 <sup>8</sup>                                | +58            | +51            | +41            | +33            | +25            | +21            | +22            | +26            | +31            | +39            | +47             | +55             | +61             | +65             | +67             | +66             | +62             | +55             | +48             | +39             | +30             |
| 15 <sup>0</sup>                                | +50            | +42            | +33            | +23            | +16            | +12            | +14            | +18            | +26            | +34            | +42             | +50             | +56             | +59             | +61             | +60             | +55             | +48             | +39             | +29             | +21             |
| 15 <sup>2</sup>                                | +40            | +30            | +19            | +10            | +2             | 0              | +2             | +9             | +17            | +26            | +35             | +42             | +48             | +52             | +52             | +50             | +45             | +36             | +27             | +15             | +7              |
| 15 <sup>4</sup>                                | +24            | +12            | 0              | -10            | -17            | -18            | -13            | -6             | +5             | +16            | +25             | +33             | +38             | +41             | +40             | +37             | +29             | +21             | +9              | -3              | -12             |
| 15 <sup>6</sup>                                | +2             | -11            | *              | *              | *              | *              | *              | -25            | -11            | 0              | +11             | +19             | +24             | +25             | +24             | +19             | +10             | -1              | *               | *               | *               |
| 15 <sup>8</sup>                                | *              | *              | *              | *              | *              | *              | *              | *              | *              | -20            | -8              | 0               | +5              | +5              | +2              | -5              | -16             | *               | *               | *               | *               |
| 17 <sup>6</sup>                                | *              | *              | +2             | -5             | -9             | -4             | +2             | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | -1              | -5              |
| 17 <sup>8</sup>                                | -3             | -14            | -21            | -25            | -26            | -23            | -17            | -8             | +4             | *              | *               | *               | *               | *               | *               | *               | *               | -7              | -17             | -23             | -26             |
| 18 <sup>0</sup>                                | -24            | -33            | -39            | -41            | -40            | -36            | -30            | -22            | -12            | -2             | +8              | *               | *               | *               | *               | -5              | -17             | -27             | -35             | -40             | -41             |

No constant has been applied.

The unit equals 0<sup>o</sup>0000.

This Table is complementary to Table XLVIII.

When the Latitude as derived from

Tables XXX—XXXVIII lies between 0<sup>o</sup>50 and 0<sup>o</sup>95 or between 2<sup>o</sup>50 and 2<sup>o</sup>95, it supplies an equation which must be applied to it before it is used as argument of Table XLVa.

# SATELLITE IV

## Tables of the Phenomena

XLVa

Semiduration

Argument Latitude

| Lat   | Semi duration | 3<br>Δ<br>oor | 4<br>1/2 Δ <sup>2</sup> | 5<br>Co r<br>Sh Tr | 6<br>L t |
|-------|---------------|---------------|-------------------------|--------------------|----------|
| 0 500 | <sup>a</sup>  |               |                         |                    | 2 500    |
| 0 502 | 0064 1        | 2 66          | 471                     | - 31               | 2 498    |
| 504   | 905           | 1171          | 77                      | 44                 | 2 496    |
| 506   | 1 84          | 935           | 40                      | 54                 | 2 494    |
| 508   | 1 793         | 8 4           | 6                       | 6                  | 2 492    |
| 510   | 14298         | 715           | 19                      | 69                 | 2 490    |
| 0 512 | 0015654       | 651           | 14                      | - 76               | 2 488    |
| 514   | 169           | 6             | 11                      | 82                 | 2 486    |
| 516   | 18 60         | 561           | 9                       | 87                 | 2 484    |
| 518   | 19145         | 5 8           | 8                       | 9                  | 2 482    |
| 520   | 17            | 5 1           | 6                       | 98                 | 2 480    |
| 0 522 | 00 1148       | 477           | 6                       | - 1                | 2 478    |
| 524   | 2 78          | 455           | 5                       | 107                | 2 476    |
| 526   | 968           | 436           | 5                       | 111                | 2 474    |
| 528   | 38            | 419           | 4                       | 115                | 2 472    |
| 530   | 4645          | 405           | 3                       | 119                | 2 470    |
| 0 532 | 0025441       | 392           | 3                       | - 123              | 2 468    |
| 534   | 6211          | 379           | 3                       | 1 7                | 2 466    |
| 536   | 6958          | 368           | 3                       | 13                 | 2 464    |
| 538   | 7683          | 358           | 3                       | 134                | 2 462    |
| 540   | 28388         | 348           |                         | 137                | 2 460    |
| 0 542 | 0029074       | 339           |                         | - 141              | 2 458    |
| 544   | 9743          | 331           | 2                       | 143                | 2 456    |
| 546   | 3 397         | 323           |                         | 147                | 2 454    |
| 548   | 31035         | 315           |                         | 150                | 2 452    |
| 550   | 31658         | 3 9           | 2                       | 153                | 2 450    |
| 0 552 | 0 3 69        | 30            |                         | - 156              | 2 448    |
| 554   | 3 866         | 96            | 1                       | 159                | 2 446    |
| 556   | 33453         | 291           | 1                       | 162                | 2 444    |
| 558   | 340 9         | 285           | 1                       | 164                | 2 442    |
| 560   | 34592         | 79            | 1                       | 167                | 2 440    |
| 0 562 | 0035145       | 75            | 1                       | - 170              | 2 438    |
| 564   | 35690         | 7             | 1                       | 17                 | 2 436    |
| 566   | 362 6         | 65            | 1                       | 175                | 2 434    |
| 568   | 36751         | 61            | 1                       | 178                | 2 432    |
| 570   | 37268         | 256           | 1                       | 180                | 2 430    |
| 0 572 | 0037776       | 53            | 1                       | - 183              | 2 428    |
| 574   | 38 78         | 49            | 1                       | 185                | 2 426    |
| 576   | 3877          | 46            | 1                       | 187                | 2 424    |
| 578   | 39 60         | 24            | 1                       | 190                | 2 422    |
| 580   | 39739         | 238           | 1                       | 192                | 2 420    |
| 0 582 | 0040 1        | 35            | 1                       | - 194              | 2 418    |
| 584   | 40678         | 3             | 1                       | 197                | 2 416    |
| 586   | 41138         | 29            | 1                       | 199                | 2 414    |
| 588   | 4159          | 6             | 1                       | 1                  | 2 412    |
| 590   | 4 04          | 3             | 1                       | 03                 | 2 410    |
| 0 592 | 04 48         | 20            | 1                       | - 2 5              | 2 408    |
| 594   | 4 919         | 17            | 1                       | 07                 | 2 406    |
| 596   | 43350         | 14            | 1                       | 210                | 2 404    |
| 598   | 43776         | 1             | 1                       | 21                 | 2 402    |
| 0 600 | 0 44199       | 210           | 1                       | - 13               | 2 400    |

| L t   | Sem du at on | 3<br>Δ<br>o | 4<br>Corr<br>Sh T | 5<br>Lat |
|-------|--------------|-------------|-------------------|----------|
| 0 600 | 0044199      | 1           | - 13              | 2 400    |
| 0 602 | 44615        | 07          | 15                | 2 398    |
| 604   | 450 5        | 204         | 17                | 2 396    |
| 606   | 45432        |             | 19                | 2 394    |
| 608   | 45835        | 00          | 1                 | 2 392    |
| 610   | 46 33        | 198         | 23                | 2 390    |
| 0 612 | 00466 7      | 196         | - 225             | 2 388    |
| 614   | 47017        | 194         | 7                 | 2 386    |
| 616   | 474 3        | 19          | 2 9               | 2 384    |
| 618   | 47785        | 190         | 231               | 2 382    |
| 620   | 4816         | 188         | 33                | 2 380    |
| 0 622 | 0048535      | 186         | - 34              | 2 378    |
| 624   | 48906        | 185         | 36                | 2 376    |
| 626   | 49 73        | 183         | 38                | 2 374    |
| 628   | 49637        | 181         | 240               | 2 372    |
| 630   | 49997        | 179         | 4                 | 2 370    |
| 0 632 | 05035        | 177         | - 43              | 2 368    |
| 634   | 5 705        | 176         | 45                | 2 366    |
| 636   | 51054        | 174         | 47                | 2 364    |
| 638   | 51401        | 173         | 48                | 2 362    |
| 640   | 51744        | 171         | 250               | 2 360    |
| 0 642 | 005 085      | 170         | - 252             | 2 358    |
| 644   | 5 423        | 168         | 53                | 2 356    |
| 646   | 5 757        | 166         | 55                | 2 354    |
| 648   | 53 88        | 165         | 56                | 2 352    |
| 650   | 53418        | 164         | 58                | 2 350    |
| 0 652 | 053743       | 16          | - 59              | 2 348    |
| 654   | 54066        | 161         | 61                | 2 346    |
| 656   | 54387        | 160         | 263               | 2 344    |
| 658   | 54705        | 158         | 64                | 2 342    |
| 660   | 550 0        | 157         | 66                | 2 340    |
| 0 662 | 0 5533       | 156         | - 267             | 2 338    |
| 664   | 55643        | 155         | 269               | 2 336    |
| 666   | 55951        | 153         | 70                | 2 334    |
| 668   | 56 56        | 152         | 72                | 2 332    |
| 670   | 56559        | 151         | 273               | 2 330    |
| 0 672 | 0056860      | 150         | - 2 5             | 2 328    |
| 674   | 57158        | 149         | 76                | 2 326    |
| 676   | 57454        | 148         | 278               | 2 324    |
| 678   | 57748        | 146         | 279               | 2 322    |
| 680   | 5804         | 145         | 280               | 2 320    |
| 0 682 | 00583 9      | 144         | - 282             | 2 318    |
| 684   | 58617        | 143         | 83                | 2 316    |
| 686   | 5890         | 14          | 84                | 2 314    |
| 688   | 59185        | 141         | 86                | 2 312    |
| 690   | 59466        | 140         | 87                | 2 310    |
| 0 692 | 0059746      | 139         | - 88              | 2 308    |
| 694   | 600 3        | 138         | 29                | 2 306    |
| 696   | 60298        | 137         | 91                | 2 304    |
| 698   | 60571        | 136         | 293               | 2 302    |
| 0 700 | 0060842      | 135         | - 94              | 2 300    |

| Lat   | S mi duration       | 3<br>Δ<br>oor | 4<br>Cor<br>Sh Tr | 5<br>Lat |
|-------|---------------------|---------------|-------------------|----------|
| 0 700 | <sup>a</sup> 006 84 | 135 2         | - 94              | 2 300    |
| 0 705 | 61512               | 133 0         | 297               | 2 295    |
| 710   | 6 17                | 130 6         | 3 0               | 2 290    |
| 715   | 6 818               | 128 5         | 303               | 2 285    |
| 720   | 63457               | 126 6         | 307               | 2 280    |
| 725   | 64 84               | 1 4 4         | 310               | 2 275    |
| 0 730 | 0 64701             | 12 3          | - 313             | 2 270    |
| 735   | 653 7               | 1 5           | 315               | 2 265    |
| 740   | 65906               | 118 7         | 318               | 2 260    |
| 745   | 66494               | 116 8         | 321               | 2 255    |
| 750   | 6 074               | 115 0         | 3 4               | 2 250    |
| 0 755 | 0067644             | 113           | - 327             | 2 245    |
| 760   | 68 06               | 111 6         | 3 9               | 2 240    |
| 765   | 68760               | 110 0         | 33                | 2 235    |
| 770   | 69306               | 108 3         | 335               | 2 230    |
| 775   | 69843               | 106 8         | 337               | 2 225    |
| 0 780 | 0070374             | 105 4         | - 340             | 2 220    |
| 785   | 70897               | 103 7         | 342               | 2 215    |
| 790   | 71411               | 102 1         | 345               | 2 210    |
| 795   | 71918               | 100 9         | 347               | 2 205    |
| 800   | 72420               | 99 5          | 350               | 2 200    |
| 0 805 | 0 72913             | 97 8          | - 35              | 2 195    |
| 810   | 73398               | 96 6          | 355               | 2 190    |
| 815   | 73879               | 95 5          | 357               | 2 185    |
| 820   | 74353               | 94 1          | 359               | 2 180    |
| 825   | 7482                | 92 8          | 361               | 2 175    |
| 0 830 | 0 75 81             | 91 5          | - 364             | 2 170    |
| 835   | 75735               | 90 3          | 366               | 2 165    |
| 840   | 76184               | 89 1          | 368               | 2 160    |
| 845   | 76626               | 88 0          | 370               | 2 155    |
| 850   | 77064               | 86 9          | 372               | 2 150    |
| 0 855 | 0077495             | 85 6          | - 374             | 2 145    |
| 860   | 77920               | 84 4          | 376               | 2 140    |
| 865   | 78339               | 83 3          | 378               | 2 135    |
| 870   | 78753               | 82 2          | 381               | 2 130    |
| 875   | 79161               | 81 3          | 383               | 2 125    |
| 0 880 | 0079566             | 80            | - 384             | 2 120    |
| 885   | 79963               | 79 0          | 386               | 2 115    |
| 890   | 8 356               | 78 0          | 388               | 2 110    |
| 895   | 80743               | 77 0          | 390               | 2 105    |
| 900   | 811 6               | 76 1          | 392               | 2 100    |
| 0 905 | 0081504             | 75 1          | - 394             | 2 095    |
| 910   | 81877               | 74 1          | 396               | 2 090    |
| 915   | 82 45               | 73 2          | 397               | 2 085    |
| 920   | 8 609               | 7 2           | 399               | 2 080    |
| 925   | 82967               | 71 3          | 401               | 2 075    |
| 0 930 | 0083322             | 7 4           | - 402             | 2 070    |
| 935   | 83671               | 69 5          | 4 4               | 2 065    |
| 940   | 84 17               | 68 6          | 406               | 2 060    |
| 945   | 84357               | 67 7          | 408               | 2 055    |
| 0 950 | 084694              | 66 8          | - 409             | 2 050    |

Appl dC t t oooo

Th Argum t f T bl XLV i th L it d d i d m I bl XXX XXXVIII t d by th

q f T bl XLIV TI t y m t b f t l r r t d by th q t l f T bl XLIX LI F Sh d w d T t th t l

f m l m l th t f J p t Ph f m T bl LXI must l s b p p l d

# SATELLITE IV

## Tables of the Phenomena

**XLVb**

**Semiduration**

| 1            | 2                     | 3                 | 4                              | 5            |
|--------------|-----------------------|-------------------|--------------------------------|--------------|
| Lat.         | Semi-duration.        | $\Delta$<br>0.001 | Corr. <sup>n</sup><br>Sh., Tr. | Lat.         |
| <b>0.950</b> | <sup>a</sup> 0.083704 | 66,8              | -409                           | <b>2.050</b> |
| <b>0.955</b> | 84035                 | 65,9              | 411                            | <b>2.045</b> |
| <b>0.960</b> | 84363                 | 65,1              | 412                            | <b>2.040</b> |
| <b>0.965</b> | 84686                 | 64,2              | 414                            | <b>2.035</b> |
| <b>0.970</b> | 85005                 | 63,3              | 415                            | <b>2.030</b> |
| <b>0.975</b> | 85319                 | 62,6              | 417                            | <b>2.025</b> |
| <b>0.980</b> | 0.085631              | 61,8              | -418                           | <b>2.020</b> |
| <b>0.985</b> | 85937                 | 60,8              | 420                            | <b>2.015</b> |
| <b>0.990</b> | 86239                 | 59,9              | 421                            | <b>2.010</b> |
| <b>0.995</b> | 86538                 | 59,5              | 423                            | <b>2.005</b> |
| <b>1.000</b> | 86834                 | 58,6              | 424                            | <b>2.000</b> |
| <b>1.005</b> | 0.087124              | 57,7              | -426                           | <b>1.995</b> |
| <b>1.010</b> | 87411                 | 57,0              | 427                            | <b>1.990</b> |
| <b>1.015</b> | 87694                 | 56,3              | 428                            | <b>1.985</b> |
| <b>1.020</b> | 87974                 | 55,5              | 430                            | <b>1.980</b> |
| <b>1.025</b> | 88249                 | 54,7              | 431                            | <b>1.975</b> |
| <b>1.030</b> | 0.088521              | 54,0              | -432                           | <b>1.970</b> |
| <b>1.035</b> | 88789                 | 53,3              | 434                            | <b>1.965</b> |
| <b>1.040</b> | 89054                 | 52,5              | 435                            | <b>1.960</b> |
| <b>1.045</b> | 89314                 | 51,8              | 436                            | <b>1.955</b> |
| <b>1.050</b> | 89572                 | 51,1              | 438                            | <b>1.950</b> |
| <b>1.055</b> | 0.089825              | 50,4              | -439                           | <b>1.945</b> |
| <b>1.060</b> | 90076                 | 49,7              | 440                            | <b>1.940</b> |
| <b>1.065</b> | 90322                 | 49,0              | 441                            | <b>1.935</b> |
| <b>1.070</b> | 90566                 | 48,3              | 442                            | <b>1.930</b> |
| <b>1.075</b> | 90805                 | 47,6              | 443                            | <b>1.925</b> |
| <b>1.080</b> | 0.091042              | 47,0              | -444                           | <b>1.920</b> |
| <b>1.085</b> | 91275                 | 46,2              | 446                            | <b>1.915</b> |
| <b>1.090</b> | 91504                 | 45,6              | 447                            | <b>1.910</b> |
| <b>1.095</b> | 91731                 | 45,0              | 448                            | <b>1.905</b> |
| <b>1.100</b> | 91954                 | 44,2              | 449                            | <b>1.900</b> |
| <b>1.105</b> | 0.092173              | 43,6              | -450                           | <b>1.895</b> |
| <b>1.110</b> | 92390                 | 43,0              | 451                            | <b>1.890</b> |
| <b>1.115</b> | 92603                 | 42,3              | 452                            | <b>1.885</b> |
| <b>1.120</b> | 92813                 | 41,7              | 453                            | <b>1.880</b> |
| <b>1.125</b> | 93020                 | 41,0              | 454                            | <b>1.875</b> |
| <b>1.130</b> | 0.093223              | 40,3              | -455                           | <b>1.870</b> |
| <b>1.135</b> | 93423                 | 39,8              | 456                            | <b>1.865</b> |
| <b>1.140</b> | 93621                 | 39,2              | 457                            | <b>1.860</b> |
| <b>1.145</b> | 93815                 | 38,5              | 458                            | <b>1.855</b> |
| <b>1.150</b> | 94006                 | 37,8              | 459                            | <b>1.850</b> |
| <b>1.155</b> | 0.094193              | 37,3              | -460                           | <b>1.845</b> |
| <b>1.160</b> | 94379                 | 36,7              | 461                            | <b>1.840</b> |
| <b>1.165</b> | 94560                 | 36,0              | 462                            | <b>1.835</b> |
| <b>1.170</b> | 94739                 | 35,5              | 462                            | <b>1.830</b> |
| <b>1.175</b> | 94915                 | 34,9              | 463                            | <b>1.825</b> |
| <b>1.180</b> | 0.095088              | 34,2              | -464                           | <b>1.820</b> |
| <b>1.185</b> | 95257                 | 33,7              | 465                            | <b>1.815</b> |
| <b>1.190</b> | 95425                 | 33,1              | 466                            | <b>1.810</b> |
| <b>1.195</b> | 95588                 | 32,4              | 467                            | <b>1.805</b> |
| <b>1.200</b> | 0.095749              | 31,9              | -467                           | <b>1.800</b> |

| 1            | 2                     | 3                 | 4                              | 5            |
|--------------|-----------------------|-------------------|--------------------------------|--------------|
| Lat.         | Semi-duration.        | $\Delta$<br>0.001 | Corr. <sup>n</sup><br>Sh., Tr. | Lat.         |
| <b>1.200</b> | <sup>a</sup> 0.095749 | 31,9              | -467                           | <b>1.800</b> |
| <b>1.205</b> | 95907                 | 31,4              | 468                            | <b>1.795</b> |
| <b>1.210</b> | 96063                 | 30,8              | 469                            | <b>1.790</b> |
| <b>1.215</b> | 96215                 | 30,1              | 470                            | <b>1.785</b> |
| <b>1.220</b> | 96364                 | 29,6              | 470                            | <b>1.780</b> |
| <b>1.225</b> | 96511                 | 29,0              | 471                            | <b>1.775</b> |
| <b>1.230</b> | 0.096654              | 28,4              | -472                           | <b>1.770</b> |
| <b>1.235</b> | 96795                 | 27,9              | 472                            | <b>1.765</b> |
| <b>1.240</b> | 96933                 | 27,3              | 473                            | <b>1.760</b> |
| <b>1.245</b> | 97068                 | 26,8              | 474                            | <b>1.755</b> |
| <b>1.250</b> | 97201                 | 26,2              | 474                            | <b>1.750</b> |
| <b>1.255</b> | 0.097330              | 25,6              | -475                           | <b>1.745</b> |
| <b>1.260</b> | 97457                 | 25,1              | 476                            | <b>1.740</b> |
| <b>1.265</b> | 97581                 | 24,5              | 476                            | <b>1.735</b> |
| <b>1.270</b> | 97702                 | 23,9              | 477                            | <b>1.730</b> |
| <b>1.275</b> | 97820                 | 23,4              | 477                            | <b>1.725</b> |
| <b>1.280</b> | 0.097936              | 22,9              | -478                           | <b>1.720</b> |
| <b>1.285</b> | 98049                 | 22,3              | 478                            | <b>1.715</b> |
| <b>1.290</b> | 98159                 | 21,7              | 479                            | <b>1.710</b> |
| <b>1.295</b> | 98266                 | 21,3              | 480                            | <b>1.705</b> |
| <b>1.300</b> | 98372                 | 20,7              | 480                            | <b>1.700</b> |
| <b>1.305</b> | 0.098473              | 20,1              | -481                           | <b>1.695</b> |
| <b>1.310</b> | 98573                 | 19,7              | 481                            | <b>1.690</b> |
| <b>1.315</b> | 98670                 | 19,2              | 482                            | <b>1.685</b> |
| <b>1.320</b> | 98765                 | 18,6              | 482                            | <b>1.680</b> |
| <b>1.325</b> | 98856                 | 18,0              | 483                            | <b>1.675</b> |
| <b>1.330</b> | 0.098945              | 17,4              | -483                           | <b>1.670</b> |
| <b>1.335</b> | 99030                 | 17,0              | 483                            | <b>1.665</b> |
| <b>1.340</b> | 99115                 | 16,5              | 483                            | <b>1.660</b> |
| <b>1.345</b> | 99195                 | 15,9              | 484                            | <b>1.655</b> |
| <b>1.350</b> | 99274                 | 15,4              | 484                            | <b>1.650</b> |
| <b>1.355</b> | 0.099349              | 14,9              | -484                           | <b>1.645</b> |
| <b>1.360</b> | 99423                 | 14,3              | 485                            | <b>1.640</b> |
| <b>1.365</b> | 99492                 | 13,7              | 485                            | <b>1.635</b> |
| <b>1.370</b> | 99560                 | 13,3              | 486                            | <b>1.630</b> |
| <b>1.375</b> | 99625                 | 12,8              | 486                            | <b>1.625</b> |
| <b>1.380</b> | 0.099688              | 12,3              | -486                           | <b>1.620</b> |
| <b>1.385</b> | 99748                 | 11,7              | 486                            | <b>1.615</b> |
| <b>1.390</b> | 99805                 | 11,3              | 487                            | <b>1.610</b> |
| <b>1.395</b> | 99860                 | 10,8              | 487                            | <b>1.605</b> |
| <b>1.400</b> | 99913                 | 10,2              | 487                            | <b>1.600</b> |
| <b>1.405</b> | 0.099962              | 9,6               | -488                           | <b>1.595</b> |
| <b>1.410</b> | 1.00009               | 9,2               | 488                            | <b>1.590</b> |
| <b>1.415</b> | 1.00054               | 8,6               | 488                            | <b>1.585</b> |
| <b>1.420</b> | 1.00095               | 8,1               | 488                            | <b>1.580</b> |
| <b>1.425</b> | 1.00135               | 7,6               | 488                            | <b>1.575</b> |
| <b>1.430</b> | 0.100171              | 7,1               | -489                           | <b>1.570</b> |
| <b>1.435</b> | 1.00206               | 6,7               | 489                            | <b>1.565</b> |
| <b>1.440</b> | 1.00238               | 6,1               | 489                            | <b>1.560</b> |
| <b>1.445</b> | 1.00267               | 5,6               | 489                            | <b>1.555</b> |
| <b>1.450</b> | 0.100294              | 5,1               | -489                           | <b>1.550</b> |

| 1            | 2                     | 3                 | 4                              | 5            |
|--------------|-----------------------|-------------------|--------------------------------|--------------|
| Lat.         | Semi-duration.        | $\Delta$<br>0.001 | Corr. <sup>n</sup><br>Sh., Tr. | Lat.         |
| <b>1.450</b> | <sup>a</sup> 0.100294 | 5,1               | -489                           | <b>1.550</b> |
| <b>1.455</b> | 1.00318               | 4,6               | 489                            | <b>1.545</b> |
| <b>1.460</b> | 1.00340               | 4,0               | 489                            | <b>1.540</b> |
| <b>1.465</b> | 1.00358               | 3,5               | 490                            | <b>1.535</b> |
| <b>1.470</b> | 1.00375               | 3,0               | 490                            | <b>1.530</b> |
| <b>1.475</b> | 1.00388               | 2,6               | 490                            | <b>1.525</b> |
| <b>1.480</b> | 0.100401              | 2,1               | -490                           | <b>1.520</b> |
| <b>1.485</b> | 1.00409               | 1,5               | 490                            | <b>1.515</b> |
| <b>1.490</b> | 1.00416               | 1,0               | 490                            | <b>1.510</b> |
| <b>1.495</b> | 1.00419               | 0,5               | 490                            | <b>1.505</b> |
| <b>1.500</b> | 0.100421              | 0,0               | -490                           | <b>1.500</b> |

Added Constant:  $-0.001000$ . The Argument of Table XLVb is the Latitude as taken from Tables XXX-XXXVIII.

The entry must be corrected by the equations from Tables XLVI-LI. For Shadows and Transits the correction from column 4 must be applied, and also that for Jupiter's Phase from Table LXI.

# SATELLITE IV

## Tables of the Phenomena

XLVI

Equation of Semiduration

| Va<br>L t | - 0 - 0 - 0<br>160 156 152 | - 0 - 0 - 0<br>148 144 140 | - 0 - 0 - 0<br>136 132 128 | - 0 - 0 - 0<br>124 120 116 | - 0 - 0 - 0<br>112 108 104 | - 0 - 0 - 0<br>100 096 092 | - 0 - 0 - 0<br>088 084 080 | Var<br>Lat |
|-----------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|------------|
| 0 90      | 614 6 1 6 8                | 635 64 649                 | 657 664 671                | 678 685 69                 | 7 707 714                  | 7 1 728 735                | 74 75 757                  | 2 10       |
| 0 92      | 57 580 588                 | 597 605 613                | 6 1 6 9 638                | 646 654 66                 | 670 679 687                | 695 7 3 711                | 720 728 736                | 2 08       |
| 0 94      | 533 541 550                | 560 569 578                | 587 596 606                | 615 6 4 633                | 64 65 661                  | 670 679 688                | 698 707 716                | 2 06       |
| 0 96      | 495 505 515                | 526 536 546                | 556 566 576                | 586 596 607                | 617 6 7 637                | 647 657 667                | 677 687 698                | 2 04       |
| 0 98      | 460 471 482                | 493 5 4 515                | 5 6 537 548                | 559 57 581                 | 59 6 3 614                 | 6 5 636 647                | 658 669 68                 | 2 02       |
| 1 00      | 4 7 439 451                | 463 475 486                | 498 510 5                  | 534 516 557                | 569 581 593                | 605 616 6 8                | 64 65 663                  | 2 00       |
| 1 02      | 397 409 4 2                | 435 447 46                 | 473 485 498                | 510 5 3 535                | 548 560 573                | 586 598 611                | 6 3 636 648                | 1 98       |
| 1 04      | 368 381 395                | 408 4 435                  | 448 461 475                | 488 50 514                 | 5 8 541 555                | 568 581 594                | 607 621 634                | 1 96       |
| 1 06      | 341 355 369                | 383 397 411                | 4 5 439 453                | 467 481 495                | 503 523 537                | 551 564 579                | 592 607 6 0                | 1 94       |
| 1 08      | 316 33 345                 | 360 375 389                | 404 418 433                | 447 46 476                 | 491 5 6 5 1                | 535 549 564                | 578 593 608                | 1 92       |
| 1 10      | 9 307 3 3                  | 338 353 368                | 384 398 414                | 4 9 444 459                | 475 490 505                | 5 0 535 551                | 565 581 596                | 1 90       |
| 1 12      | 70 286 302                 | 317 333 349                | 365 380 396                | 412 4 8 443                | 459 475 491                | 506 522 538                | 553 569 585                | 1 88       |
| 1 14      | 5 66 28                    | 98 315 331                 | 347 363 38                 | 396 412 428                | 445 461 478                | 493 509 526                | 542 559 574                | 1 86       |
| 1 16      | 3 47 64                    | 280 297 313                | 331 347 364                | 381 398 414                | 431 448 465                | 481 498 515                | 531 548 565                | 1 84       |
| 1 18      | 1 9 46                     | 63 81 98                   | 315 332 35                 | 367 384 4 1                | 419 435 453                | 470 487 504                | 5 1 539 556                | 1 82       |
| 1 20      | 196 13 31                  | 48 66 283                  | 301 319 337                | 354 372 389                | 407 4 4 44                 | 460 477 495                | 512 530 547                | 1 80       |
| 1 22      | 181 198 17                 | 234 53 27                  | 89 306 3 5                 | 34 361 378                 | 397 414 433                | 450 468 486                | 504 52 540                 | 1 78       |
| 1 24      | 166 184 2 3                | 21 40 58                   | 76 94 313                  | 331 350 368                | 387 405 423                | 441 459 478                | 496 515 533                | 1 76       |
| 1 26      | 154 17 191                 | 209 9 247                  | 266 84 303                 | 3 341 359                  | 378 396 415                | 434 452 471                | 489 508 5 6                | 1 74       |
| 1 28      | 14 160 180                 | 198 18 236                 | 56 74 93                   | 31 331 35                  | 369 388 4 7                | 426 444 464                | 48 50 5 0                  | 1 72       |
| 1 30      | 131 15 169                 | 188 208 227                | 46 65 85                   | 304 3 3 34                 | 36 381 40                  | 419 438 458                | 477 496 515                | 1 70       |
| 1 32      | 1 1 14 160                 | 179 199 18                 | 38 57 77                   | 96 316 335                 | 355 374 394                | 413 432 45                 | 471 491 510                | 1 68       |
| 1 34      | 114 133 153                | 172 19 1                   | 3 251 271                  | 290 311 330                | 350 369 389                | 408 428 448                | 467 487 506                | 1 66       |
| 1 36      | 106 1 5 145                | 165 185 5                  | 5 44 65                    | 284 304 3 4                | 344 364 381                | 403 423 444                | 463 483 502                | 1 64       |
| 1 38      | 99 119 139                 | 159 179 199                | 19 39 259                  | 79 300 319                 | 340 359 38                 | 399 419 439                | 459 479 499                | 1 62       |
| 1 40      | 93 113 134                 | 153 174 194                | 14 234 55                  | 75 95 315                  | 336 355 376                | 396 415 436                | 456 476 496                | 1 60       |
| 1 42      | 89 109 130                 | 150 17 190                 | 211 231 25                 | 27 29 312                  | 333 353 373                | 393 413 434                | 454 474 494                | 1 58       |
| 1 44      | 85 105 126                 | 146 167 187                | 07 7 48                    | 68 89 3 9                  | 330 350 371                | 391 410 431                | 451 472 492                | 1 56       |
| 1 46      | 83 103 1 4                 | 144 164 184                | 05 5 246                   | 266 87 307                 | 3 8 348 369                | 389 409 430                | 450 471 491                | 1 54       |
| 1 48      | 81 101 1 2                 | 142 163 183                | 204 4 245                  | 65 86 306                  | 3 7 347 368                | 388 408 4 9                | 449 470 490                | 1 52       |
| 1 50      | 81 101 1                   | 14 163 183                 | 204 2 4 45                 | 65 86 306                  | 3 7 347 368                | 388 4 8 429                | 449 470 490                | 1 50       |

Appl d C t t + Th t q l oo Thl T bl i mpl m t y t T bl XLVII  
It ppl t th S m d ti wh h ppl bl wl th L t t d d i d f m T bl XXX XXXVIII li b t 95 d 5

# SATELLITE IV

## Tables of the Phenomena

XLVI *continued*

Equation of Semiduration

| Var.<br>Lat. | - 0 - 0 - 0<br>080 076 072 | - 0 - 0 - 0<br>068 064 060 | - 0 - 0 - 0<br>056 052 048 | - 0 - 0 - 0<br>044 040 036 | - 0 - 0 - 0<br>032 028 024 | - 0 - 0 - 0<br>020 016 012 | - 0 - 0 - 0<br>008 004 000 | Var.<br>Lat. |
|--------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|--------------|
| 0°90         | 757 764 771                | 778 785 793                | 800 807 814                | 821 828 836                | 843 850 857                | 864 871 879                | 886 893 900                | 2°10         |
| 0°92         | 736 744 752                | 761 769 777                | 785 793 802                | 810 818 826                | 834 843 851                | 859 867 875                | 884 892 900                | 2°08         |
| 0°94         | 716 725 734                | 744 753 762                | 771 780 790                | 799 808 817                | 826 836 845                | 854 863 872                | 882 891 900                | 2°06         |
| 0°96         | 698 708 718                | 728 738 748                | 758 768 779                | 789 799 809                | 819 829 839                | 849 860 870                | 880 890 900                | 2°04         |
| 0°98         | 680 691 702                | 713 724 735                | 746 757 768                | 779 790 801                | 812 823 834                | 845 856 867                | 878 889 900                | 2°02         |
| 1°00         | 663 676 687                | 699 711 723                | 735 747 758                | 770 782 794                | 805 817 829                | 841 853 865                | 876 888 900                | 2°00         |
| 1°02         | 648 661 673                | 686 699 712                | 724 737 749                | 762 774 787                | 799 812 824                | 837 850 863                | 875 888 900                | 1°98         |
| 1°04         | 634 648 661                | 674 687 701                | 714 727 740                | 754 767 781                | 794 807 820                | 834 847 860                | 873 887 900                | 1°96         |
| 1°06         | 620 635 648                | 663 676 691                | 704 719 732                | 747 760 775                | 788 802 816                | 830 844 858                | 872 886 900                | 1°94         |
| 1°08         | 608 623 637                | 652 666 681                | 695 710 725                | 740 754 769                | 783 798 812                | 827 842 857                | 871 886 900                | 1°92         |
| 1°10         | 596 611 626                | 642 657 672                | 687 703 717                | 733 748 763                | 778 794 809                | 824 839 855                | 870 885 900                | 1°90         |
| 1°12         | 585 601 616                | 632 648 664                | 679 695 711                | 727 742 759                | 774 790 805                | 822 837 853                | 868 885 900                | 1°88         |
| 1°14         | 574 591 607                | 624 640 656                | 672 689 705                | 721 737 754                | 770 786 802                | 819 835 852                | 867 884 900                | 1°86         |
| 1°16         | 565 582 598                | 615 632 649                | 665 682 699                | 716 732 749                | 766 783 799                | 817 833 850                | 866 884 900                | 1°84         |
| 1°18         | 556 573 590                | 608 624 642                | 659 677 693                | 711 728 745                | 762 780 797                | 814 831 849                | 866 883 900                | 1°82         |
| 1°20         | 547 565 583                | 601 618 636                | 653 671 688                | 706 724 742                | 759 777 794                | 812 829 848                | 865 883 900                | 1°80         |
| 1°22         | 540 558 576                | 594 612 630                | 648 666 684                | 702 720 738                | 756 774 792                | 810 828 846                | 864 882 900                | 1°78         |
| 1°24         | 533 551 569                | 588 606 625                | 643 662 680                | 698 716 735                | 753 772 790                | 809 827 845                | 863 882 900                | 1°76         |
| 1°26         | 526 546 564                | 583 601 620                | 639 658 676                | 695 713 732                | 751 770 788                | 807 825 844                | 863 882 900                | 1°74         |
| 1°28         | 520 540 558                | 578 596 616                | 634 654 672                | 692 710 730                | 748 768 786                | 806 824 844                | 862 881 900                | 1°72         |
| 1°30         | 515 535 554                | 573 592 612                | 631 650 669                | 689 708 727                | 746 766 785                | 804 823 843                | 862 881 900                | 1°70         |
| 1°32         | 510 530 549                | 569 588 608                | 627 647 666                | 686 705 725                | 744 764 783                | 803 822 842                | 861 881 900                | 1°68         |
| 1°34         | 506 527 546                | 566 585 605                | 624 645 664                | 684 703 723                | 743 763 782                | 802 821 841                | 861 881 900                | 1°66         |
| 1°36         | 502 523 542                | 562 582 602                | 622 642 661                | 682 701 722                | 741 761 781                | 801 820 841                | 860 881 900                | 1°64         |
| 1°38         | 499 520 539                | 560 579 600                | 619 640 659                | 680 700 720                | 740 760 780                | 800 820 840                | 860 880 900                | 1°62         |
| 1°40         | 496 517 537                | 557 577 598                | 617 638 658                | 678 698 719                | 738 759 779                | 800 819 840                | 860 880 900                | 1°60         |
| 1°42         | 494 515 535                | 555 575 596                | 616 637 656                | 677 697 718                | 738 758 778                | 799 819 840                | 859 880 900                | 1°58         |
| 1°44         | 492 513 533                | 554 574 595                | 614 635 655                | 676 696 717                | 737 758 778                | 799 818 839                | 859 880 900                | 1°56         |
| 1°46         | 491 512 532                | 553 573 594                | 614 635 654                | 675 695 716                | 736 757 777                | 798 818 839                | 859 880 900                | 1°54         |
| 1°48         | 490 511 531                | 552 572 593                | 613 634 654                | 675 695 716                | 736 757 777                | 798 818 839                | 859 880 900                | 1°52         |
| 1°50         | 490 511 531                | 552 572 593                | 613 634 654                | 675 695 716                | 736 757 777                | 798 818 839                | 859 880 900                | 1°50         |

Applied Constant: +900.

The unit equals 0<sup>d</sup>.000001.

This Table is complementary to Table XLII.

It supplies a correction to the Semiduration which is applicable when the Latitude as derived from Tables XXX-XXXVIII lies between 0°95 and 2°05.



# SATELLITE IV

## Tables of the Phenomena

XLVI continued

Equation of Semiduration

| Var  | 0 + 0 + 0 |     |     | + 0 + 0 + 0 |     |      | + 0 + 0 + 0 |      |      | + 0 + 0 + 0 |      |      | + 0 + 0 + 0 |      |      | + 0 + 0 + 0 |      |      | + 0 + 0 + 0 |      |      | Var  |
|------|-----------|-----|-----|-------------|-----|------|-------------|------|------|-------------|------|------|-------------|------|------|-------------|------|------|-------------|------|------|------|
| Lat  | 000       | 004 | 008 | 012         | 016 | 020  | 024         | 028  | 032  | 036         | 040  | 044  | 048         | 052  | 056  | 060         | 064  | 068  | 072         | 076  | 080  | Lat  |
| 0 90 | 900       | 907 | 914 | 921         | 9 9 | 936  | 943         | 950  | 957  | 964         | 97   | 979  | 986         | 993  | 1000 | 1007        | 1015 | 102  | 1029        | 1036 | 1043 | 2 10 |
| 0 92 | 900       | 908 | 916 | 925         | 933 | 941  | 949         | 957  | 966  | 974         | 982  | 99   | 998         | 10 7 | 1015 | 10 3        | 1031 | 1039 | 1048        | 1056 | 1064 | 2 08 |
| 0 94 | 90        | 909 | 918 | 9 8         | 937 | 946  | 955         | 964  | 974  | 983         | 99   | 1 01 | 1010        | 10 0 | 10 9 | 1 38        | 1047 | 1056 | 1 66        | 1075 | 1084 | 2 06 |
| 0 96 | 9         | 910 | 9 0 | 930         | 940 | 951  | 961         | 971  | 981  | 991         | 1001 | 1 11 | 1 21        | 103  | 1042 | 105         | 1062 | 1 7  | 1082        | 1092 | 11 2 | 2 04 |
| 0 98 | 900       | 911 | 922 | 933         | 944 | 955  | 966         | 977  | 988  | 999         | 1010 | 1 1  | 1 3         | 1043 | 1054 | 1 65        | 1076 | 1087 | 1 98        | 11 9 | 11   | 2 02 |
| 1 00 | 900       | 912 | 9 4 | 935         | 947 | 959  | 971         | 983  | 995  | 10 6        | 1 18 | 1030 | 1 4         | 1053 | 1066 | 1077        | 1089 | 1101 | 1113        | 11 4 | 1137 | 2 00 |
| 1 02 | 900       | 91  | 9 5 | 937         | 95  | 963  | 976         | 988  | 1001 | 1013        | 10 6 | 1038 | 1051        | 1063 | 1076 | 1088        | 1101 | 1114 | 11 7        | 1139 | 1152 | 1 98 |
| 1 04 | 9         | 913 | 9 7 | 940         | 953 | 966  | 980         | 993  | 1006 | 1019        | 1033 | 1046 | 1060        | 1073 | 1086 | 1099        | 1113 | 1126 | 1139        | 115  | 1166 | 1 96 |
| 1 06 | 900       | 914 | 928 | 94          | 956 | 970  | 984         | 998  | 101  | 10 5        | 104  | 1053 | 1 68        | 1081 | 1096 | 1109        | 11 4 | 1137 | 115         | 1165 | 1180 | 1 94 |
| 1 08 | 900       | 914 | 929 | 943         | 958 | 973  | 988         | 100  | 1017 | 1031        | 1046 | 1060 | 1075        | 109  | 1105 | 1119        | 1134 | 1148 | 1163        | 1177 | 1192 | 1 92 |
| 1 10 | 9         | 915 | 930 | 945         | 961 | 976  | 991         | 1006 | 102  | 1037        | 105  | 1067 | 1083        | 1097 | 1113 | 11 8        | 1143 | 1158 | 1174        | 1189 | 1 04 | 1 90 |
| 1 12 | 9         | 915 | 932 | 947         | 963 | 978  | 995         | 1010 | 10 6 | 1041        | 1 58 | 1073 | 1089        | 1105 | 11 1 | 1136        | 1152 | 1168 | 1184        | 1199 | 1 15 | 1 88 |
| 1 14 | 900       | 916 | 933 | 948         | 965 | 981  | 998         | 1014 | 1030 | 1046        | 1063 | 1079 | 1095        | 1111 | 11 8 | 1144        | 1160 | 1176 | 1193        | 1209 | 1 26 | 1 86 |
| 1 16 | 900       | 916 | 934 | 950         | 967 | 983  | 1001        | 1017 | 1034 | 1051        | 1068 | 1084 | 1101        | 1118 | 1135 | 1151        | 1168 | 1185 | 1202        | 1218 | 1235 | 1 84 |
| 1 18 | 9 0       | 917 | 934 | 951         | 969 | 986  | 1003        | 10 0 | 1038 | 1 55        | 107  | 1089 | 1107        | 1123 | 1141 | 1158        | 1176 | 119  | 1210        | 1 7  | 1244 | 1 82 |
| 1 20 | 900       | 917 | 935 | 95          | 971 | 988  | 1006        | 10 3 | 1041 | 1058        | 1076 | 1094 | 111         | 1129 | 1147 | 1164        | 118  | 1199 | 1217        | 1235 | 1253 | 1 80 |
| 1 22 | 900       | 918 | 936 | 954         | 972 | 990  | 1008        | 1 26 | 1044 | 1062        | 1080 | 1098 | 1116        | 1134 | 1152 | 1170        | 1188 | 1206 | 1 24        | 124  | 1 60 | 1 78 |
| 1 24 | 9 0       | 918 | 937 | 955         | 973 | 991  | 1010        | 1 8  | 1047 | 1065        | 1084 | 1102 | 1120        | 1138 | 1157 | 1175        | 1194 | 1212 | 1 31        | 1249 | 1267 | 1 76 |
| 1 26 | 900       | 918 | 937 | 956         | 975 | 993  | 101         | 1030 | 1049 | 1 68        | 1087 | 1105 | 1124        | 114  | 1161 | 1180        | 1199 | 1217 | 1236        | 1 54 | 1 74 | 1 74 |
| 1 28 | 9         | 919 | 938 | 956         | 976 | 994  | 1 14        | 103  | 1052 | 1 7         | 1090 | 11 8 | 11 8        | 1146 | 1166 | 1184        | 1204 | 122  | 1 4         | 1260 | 1280 | 1 72 |
| 1 30 | 900       | 919 | 938 | 957         | 977 | 996  | 1015        | 1034 | 1054 | 1073        | 109  | 1111 | 1131        | 1150 | 1169 | 1188        | 1208 | 1227 | 1246        | 1265 | 1 85 | 1 70 |
| 1 32 | 9 0       | 919 | 939 | 958         | 978 | 997  | 1017        | 1036 | 1056 | 1 75        | 1095 | 1114 | 1134        | 1153 | 1173 | 1192        | 1212 | 1231 | 1251        | 1270 | 1290 | 1 68 |
| 1 34 | 900       | 919 | 939 | 959         | 979 | 998  | 1018        | 1 37 | 1 57 | 1 77        | 1097 | 1116 | 1136        | 1155 | 1176 | 1195        | 1215 | 1234 | 1254        | 1 73 | 1 94 | 1 66 |
| 1 36 | 90        | 919 | 94  | 959         | 98  | 999  | 1 19        | 1039 | 1 59 | 1078        | 1 99 | 1118 | 1139        | 1158 | 1178 | 1198        | 1 18 | 1238 | 1258        | 1277 | 1 98 | 1 64 |
| 1 38 | 900       | 92  | 940 | 960         | 980 | 100  | 10 0        | 1040 | 1060 | 1080        | 1100 | 1120 | 1141        | 1160 | 1181 | 1200        | 1221 | 1 40 | 1261        | 1280 | 1301 | 1 62 |
| 1 40 | 900       | 920 | 940 | 960         | 981 | 1000 | 10 1        | 1041 | 106  | 1 81        | 110  | 1122 | 1142        | 1162 | 1183 | 1202        | 12 3 | 1243 | 1 63        | 1283 | 1304 | 1 60 |
| 1 42 | 900       | 920 | 941 | 960         | 981 | 10 1 | 1 2         | 1042 | 106  | 1082        | 1103 | 1123 | 1144        | 1163 | 1184 | 1204        | 12 5 | 1 45 | 1265        | 1285 | 1306 | 1 58 |
| 1 44 | 900       | 9 0 | 941 | 961         | 98  | 1001 | 10          | 1 42 | 1 63 | 1 83        | 11 4 | 11 4 | 1145        | 1165 | 1186 | 1 05        | 1 26 | 1246 | 1267        | 1 87 | 1308 | 1 56 |
| 1 46 | 9 0       | 9 0 | 941 | 961         | 98  | 1 0  | 3           | 1 43 | 1064 | 1084        | 11 5 | 11 5 | 1146        | 1165 | 1186 | 1206        | 1 27 | 1 47 | 1 68        | 1 88 | 1309 | 1 54 |
| 1 48 | 900       | 920 | 941 | 961         | 98  | 10   | 1 3         | 1 43 | 1064 | 1084        | 1105 | 11 5 | 1146        | 1166 | 1187 | 1207        | 12 8 | 1248 | 1269        | 1289 | 1310 | 1 52 |
| 1 50 | 900       | 920 | 941 | 961         | 982 | 1002 | 10 3        | 1043 | 1064 | 1084        | 1105 | 1125 | 1146        | 1166 | 1187 | 1207        | 1228 | 1248 | 1 69        | 1289 | 1310 | 1 50 |

Appl d C t t +g      Tl it i l      Th T bl i mpl m t y t T bl XLII

It ppl      t t tl S m dur t      whi h      ppl bl wh      th L t t d      d i d f m T bl XXX XXXVIII l b tw      95 d s



# SATELLITE IV

## Tables of the Phenomena

XLVI *continued*

Equation of Semiduration

| Var.<br>Lat. | +0 +0 +0<br>080 084 088 | +0 +0 +0<br>092 096 100 | +0 +0 +0<br>104 108 112 | +0 +0 +0<br>116 120 124 | +0 +0 +0<br>128 132 136 | +0 +0 +0<br>140 144 148 | +0 +0 +0<br>152 156 160 | Var.<br>Lat. |
|--------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------|
| 0.90         | 1043 1050 1058          | 1065 1072 1079          | 1086 1093 1100          | 1108 1115 1122          | 1129 1136 1143          | 1151 1158 1165          | 1172 1179 1186          | 2.10         |
| 0.92         | 1064 1072 1080          | 1089 1097 1105          | 1113 1121 1130          | 1138 1146 1154          | 1162 1171 1179          | 1187 1195 1203          | 1212 1220 1228          | 2.08         |
| 0.94         | 1084 1093 1102          | 1112 1121 1130          | 1139 1148 1158          | 1167 1176 1185          | 1194 1204 1213          | 1222 1231 1240          | 1250 1259 1267          | 2.06         |
| 0.96         | 1102 1113 1123          | 1133 1143 1153          | 1163 1173 1183          | 1193 1204 1214          | 1224 1234 1244          | 1254 1264 1274          | 1285 1295 1305          | 2.04         |
| 0.98         | 1120 1131 1142          | 1153 1164 1175          | 1186 1197 1208          | 1219 1230 1241          | 1252 1263 1274          | 1285 1296 1307          | 1318 1329 1340          | 2.02         |
| 1.00         | 1137 1148 1160          | 1172 1184 1195          | 1207 1219 1231          | 1243 1254 1266          | 1278 1290 1302          | 1314 1325 1337          | 1349 1361 1373          | 2.00         |
| 1.02         | 1152 1164 1177          | 1189 1202 1214          | 1227 1240 1252          | 1265 1277 1290          | 1302 1315 1327          | 1340 1353 1365          | 1378 1391 1403          | 1.98         |
| 1.04         | 1166 1179 1193          | 1206 1219 1232          | 1245 1259 1272          | 1286 1298 1312          | 1325 1339 1352          | 1365 1378 1392          | 1405 1419 1432          | 1.96         |
| 1.06         | 1180 1193 1208          | 1221 1236 1249          | 1263 1277 1291          | 1305 1319 1333          | 1347 1361 1375          | 1389 1403 1417          | 1431 1445 1459          | 1.94         |
| 1.08         | 1192 1207 1222          | 1236 1251 1265          | 1279 1294 1309          | 1324 1338 1353          | 1367 1382 1396          | 1411 1425 1440          | 1455 1470 1484          | 1.92         |
| 1.10         | 1204 1219 1235          | 1249 1265 1280          | 1295 1310 1325          | 1341 1356 1371          | 1386 1402 1416          | 1432 1447 1462          | 1477 1493 1508          | 1.90         |
| 1.12         | 1215 1231 1247          | 1262 1278 1294          | 1309 1325 1341          | 1357 1372 1388          | 1404 1420 1435          | 1451 1467 1483          | 1498 1514 1530          | 1.88         |
| 1.14         | 1226 1241 1258          | 1274 1291 1307          | 1322 1339 1355          | 1372 1388 1404          | 1420 1437 1453          | 1469 1485 1502          | 1518 1534 1550          | 1.86         |
| 1.16         | 1235 1252 1269          | 1285 1302 1319          | 1335 1352 1369          | 1386 1402 1419          | 1436 1453 1469          | 1487 1503 1520          | 1536 1553 1570          | 1.84         |
| 1.18         | 1244 1261 1279          | 1296 1313 1330          | 1347 1365 1381          | 1399 1416 1433          | 1450 1468 1485          | 1502 1519 1537          | 1554 1571 1588          | 1.82         |
| 1.20         | 1253 1270 1288          | 1305 1323 1340          | 1358 1376 1393          | 1411 1428 1446          | 1463 1481 1499          | 1517 1534 1552          | 1569 1587 1604          | 1.80         |
| 1.22         | 1260 1278 1296          | 1314 1332 1350          | 1367 1386 1403          | 1422 1439 1458          | 1475 1494 1512          | 1530 1547 1566          | 1583 1602 1619          | 1.78         |
| 1.24         | 1267 1285 1304          | 1322 1341 1359          | 1377 1395 1413          | 1432 1450 1469          | 1487 1506 1524          | 1542 1560 1579          | 1597 1616 1634          | 1.76         |
| 1.26         | 1274 1292 1311          | 1329 1348 1366          | 1385 1404 1422          | 1441 1459 1478          | 1497 1516 1534          | 1553 1571 1591          | 1609 1628 1646          | 1.74         |
| 1.28         | 1280 1298 1318          | 1336 1356 1374          | 1393 1412 1431          | 1450 1469 1488          | 1507 1526 1544          | 1564 1582 1602          | 1620 1640 1658          | 1.72         |
| 1.30         | 1285 1304 1323          | 1342 1362 1381          | 1400 1419 1438          | 1458 1477 1496          | 1515 1535 1554          | 1573 1592 1612          | 1631 1650 1669          | 1.70         |
| 1.32         | 1290 1309 1329          | 1348 1368 1387          | 1406 1426 1445          | 1465 1484 1504          | 1523 1543 1562          | 1582 1601 1621          | 1640 1660 1679          | 1.68         |
| 1.34         | 1294 1313 1333          | 1352 1372 1392          | 1411 1431 1450          | 1470 1489 1510          | 1529 1549 1568          | 1588 1608 1628          | 1647 1667 1686          | 1.66         |
| 1.36         | 1298 1317 1337          | 1356 1377 1397          | 1416 1436 1456          | 1476 1496 1516          | 1535 1556 1575          | 1595 1615 1635          | 1655 1675 1694          | 1.64         |
| 1.38         | 1301 1321 1341          | 1361 1381 1401          | 1420 1441 1460          | 1481 1500 1521          | 1541 1561 1581          | 1601 1621 1641          | 1661 1681 1701          | 1.62         |
| 1.40         | 1304 1324 1344          | 1364 1385 1404          | 1424 1445 1464          | 1485 1505 1525          | 1545 1566 1586          | 1606 1626 1647          | 1666 1687 1707          | 1.60         |
| 1.42         | 1306 1326 1346          | 1366 1387 1407          | 1427 1447 1467          | 1488 1508 1528          | 1548 1569 1589          | 1610 1630 1650          | 1670 1691 1711          | 1.58         |
| 1.44         | 1308 1328 1349          | 1369 1390 1409          | 1429 1450 1470          | 1491 1511 1532          | 1552 1573 1593          | 1613 1633 1654          | 1674 1695 1715          | 1.56         |
| 1.46         | 1309 1329 1350          | 1370 1391 1411          | 1431 1452 1472          | 1493 1513 1534          | 1554 1575 1595          | 1616 1636 1656          | 1676 1697 1717          | 1.54         |
| 1.48         | 1310 1330 1351          | 1371 1392 1412          | 1432 1453 1473          | 1494 1514 1535          | 1555 1576 1596          | 1617 1637 1658          | 1678 1699 1719          | 1.52         |
| 1.50         | 1310 1330 1351          | 1371 1392 1412          | 1432 1453 1473          | 1494 1514 1535          | 1555 1576 1596          | 1617 1637 1658          | 1678 1699 1719          | 1.50         |

Applied Constant +900.      The unit equals 0<sup>d</sup>.000001.      This Table is complementary to Table XLII.

It supplies a correction to the Semiduration which is applicable when the Latitude as derived from Tables XXX-XXXVIII lies between 0°55 and 2°05.

# SATELLITE IV

## Tables of the Phenomena

XLVII

Equation of Semiduration

Ecl, Oc

| M<br>J | 0 <sup>d</sup> | 1 <sup>d</sup> | 2 <sup>d</sup> | 3 <sup>d</sup> | 4 <sup>d</sup> | 5 <sup>d</sup> | 6 <sup>d</sup> | 7 <sup>d</sup> | 8 <sup>d</sup> | 9 <sup>d</sup> | 10 <sup>d</sup> | 11 <sup>d</sup> | 12 <sup>d</sup> | 13 <sup>d</sup> | 14 <sup>d</sup> | 15 <sup>d</sup> | 16 <sup>d</sup> | 17 <sup>d</sup> | 18 <sup>d</sup> | 19 <sup>d</sup> | 20 <sup>d</sup> |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 00     | 90             | 90             | 90             | 90             | 90             | 90             | 90             | 90             | 90             | 90             | 90              | 90              | 90              | 90              | 90              | 9               | 90              | 90              | 90              | 90              | 90              |
| 02     | 91             | 9              | 93             | 93             | 94             | 93             | 93             | 92             | 91             | 90             | 89              | 89              | 88              | 88              | 89              | 90              | 90              | 91              | 92              | 93              | 94              |
| 04     | 94             | 96             | 98             | 99             | 99             | 98             | 97             | 95             | 93             | 9              | 9               | 89              | 88              | 89              | 90              | 91              | 93              | 95              | 96              | 98              | 99              |
| 06     | 1              | 103            | 105            | 106            | 107            | 105            | 103            | 100            | 97             | 94             | 9               | 9               | 90              | 90              | 92              | 95              | 97              | 10              | 103             | 105             | 107             |
| 08     | 107            | 111            | 115            | 116            | 117            | 115            | 111            | 107            | 102            | 98             | 95              | 93              | 93              | 94              | 97              | 10              | 104             | 108             | 112             | 115             | 117             |
| 10     | 117            | 1              | 127            | 129            | 129            | 126            | 121            | 115            | 109            | 103            | 99              | 97              | 97              | 99              | 10              | 107             | 113             | 119             | 124             | 128             | 130             |
| 12     | 118            | 136            | 14             |                | *              |                | 134            | 125            | 117            | 110            | 105             | 103             | 103             | 105             | 110             | 116             | 123             | 131             | 138             | 144             | *               |
| 14     | 143            | *              | *              |                | *              |                |                |                | 106            | 117            | 111             | 109             | 109             | 11              | 118             | 106             | 135             | 146             |                 | *               | *               |
| 16     |                |                | *              | *              |                |                | *              | *              | *              |                | 119             | 115             | 116             | 120             | 128             | 138             | *               |                 | *               | *               | *               |
| 66     | *              |                | *              | *              | *              | *              |                |                | *              | *              | *               |                 | 118             | 122             | *               | *               | *               | *               | *               | *               | *               |
| 68     | *              |                |                | *              | *              | *              |                | *              |                |                | 135             | 105             | 118             | 114             | 113             | 116             | *               | *               | *               | *               | *               |
| 70     | 10             | 130            | *              | *              | *              | *              |                | *              | 142            | 132            | 124             | 116             | 110             | 108             | 107             | 110             | 115             | 103             | *               | *               | *               |
| 72     | 11             | 119            | 106            | 135            | 140            | 14             | 139            | 133            | 127            | 10             | 113             | 108             | 103             | 101             | 101             | 103             | 108             | 114             | 122             | 129             | 136             |
| 74     | 5              | 111            | 116            | 111            | 125            | 106            | 104            | 121            | 116            | 110            | 105             | 101             | 98              | 96              | 96              | 98              | 102             | 107             | 113             | 118             | 123             |
| 76     | 100            | 104            | 108            | 111            | 113            | 114            | 113            | 110            | 107            | 103            | 99              | 95              | 93              | 9               | 93              | 94              | 97              | 101             | 105             | 109             | 112             |
| 78     | 95             | 98             | 100            | 103            | 104            | 104            | 103            | 101            | 99             | 96             | 93              | 91              | 90              | 89              | 90              | 91              | 93              | 96              | 99              | 101             | 103             |
| 80     | 92             | 94             | 95             | 96             | 97             | 97             | 96             | 95             | 93             | 92             | 90              | 89              | 88              | 88              | 89              | 90              | 91              | 93              | 94              | 96              | 97              |
| 82     | 90             | 91             | 9              | 92             | 9              | 92             | 92             | 9              | 91             | 90             | 90              | 89              | 89              | 89              | 89              | 89              | 90              | 91              | 91              | 9               | 92              |
| 84     | 90             | 90             | 90             | 89             | 89             | 89             | 9              | 90             | 90             | 9              | 91              | 91              | 91              | 91              | 91              | 91              | 90              | 90              | 90              | 90              | 89              |
| 86     | 91             | 90             | 89             | 88             | 88             | 88             | 89             | 90             | 91             | 93             | 94              | 94              | 95              | 95              | 94              | 93              | 9               | 91              | 90              | 89              | 88              |
| 88     | 94             | 91             | 9              | 89             | 89             | 89             | 91             | 93             | 95             | 97             | 99              | 100             | 101             | 10              | 99              | 97              | 95              | 93              | 91              | 89              | 89              |
| 90     | 97             | 94             | 92             | 91             | 91             | 92             | 94             | 97             | 10             | 103            | 106             | 108             | 109             | 108             | 106             | 103             | 99              | 96              | 93              | 91              | 91              |
| 92     | 1              | 98             | 96             | 94             | 94             | 96             | 99             | 103            | 108            | 113            | 117             | 119             | 120             | 118             | 115             | 111             | 106             | 101             | 97              | 95              | 94              |
| 94     | 108            | 103            | 100            | 98             | 99             | 101            | 106            | 111            | 117            | 124            | 129             | 133             | 134             | 131             | 106             | 120             | 113             | 107             | 10              | 99              | 98              |
| 96     | 116            | 109            | 105            | 104            | 105            | 108            | 113            | 101            | 108            | 137            | 144             | *               | *               | *               | *               | 131             | 121             | 113             | 108             | 104             | 104             |
| 98     | 105            | 117            | 11             | 110            | 112            | 116            | 123            | 132            | 143            |                | *               | *               |                 | *               | *               | *               | *               | 122             | 115             | 111             | 110             |
| 100    |                | *              | 10             | 117            | 120            | 125            | 135            |                |                |                | *               |                 |                 | *               |                 |                 | *               |                 |                 | 118             | 118             |
| 150    | *              |                |                | 109            | 122            | 118            | 119            | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | 136             | 127             |
| 152    |                | 138            | 128            | 10             | 114            | 11             | 112            | 116            | 104            |                | *               | *               | *               | *               | *               | *               | *               | 146             | 134             | 125             | 118             |
| 154    | 134            | 106            | 118            | 111            | 107            | 105            | 106            | 109            | 115            | 103            | *               | *               | *               | *               | *               | *               | 140             | 13              | 103             | 116             | 110             |
| 156    | 102            | 115            | 109            | 104            | 101            | 99             | 10             | 103            | 108            | 114            | 1               | 129             | 134             | 137             | 136             | 132             | 106             | 120             | 113             | 107             | 103             |
| 158    | 111            | 106            | 10             | 98             | 95             | 95             | 95             | 97             | 102            | 107            | 11              | 117             | 10              | 102             | 101             | 119             | 114             | 109             | 105             | 100             | 97              |
| 160    | 103            | 99             | 96             | 93             | 91             | 91             | 9              | 94             | 97             | 10             | 104             | 107             | 110             | 111             | 110             | 108             | 105             | 101             | 98              | 95              | 9               |
| 162    | 96             | 94             | 9              | 90             | 89             | 89             | 89             | 91             | 93             | 96             | 98              | 100             | 102             | 1               | 10              | 100             | 98              | 96              | 93              | 91              | 89              |
| 164    | 92             | 91             | 91             | 89             | 88             | 88             | 89             | 90             | 91             | 9              | 94              | 95              | 95              | 96              | 95              | 94              | 93              | 92              | 90              | 89              | 88              |
| 166    | 90             | 9              | 89             | 89             | 89             | 89             | 89             | 90             | 90             | 90             | 91              | 91              | 91              | 91              | 91              | 91              | 91              | 90              | 90              | 89              | 89              |
| 168    | 9              | 91             | 91             | 9              | 9              | 9              | 91             | 91             | 91             | 90             | 89              | 89              | 89              | 89              | 89              | 89              | 90              | 91              | 91              | 91              | 9               |
| 170    | 93             | 94             | 95             | 96             | 96             | 96             | 95             | 94             | 9              | 91             | 89              | 88              | 88              | 88              | 89              | 90              | 92              | 93              | 94              | 96              | 96              |
| 172    | 97             | 99             | 101            | 103            | 103            | 10             | 1              | 98             | 95             | 9              | 91              | 89              | 89              | 89              | 91              | 93              | 95              | 98              | 100             | 1               | 103             |
| 174    | 103            | 107            | 110            | 111            | 111            | 110            | 107            | 104            | 100            | 96             | 93              | 9               | 91              | 92              | 94              | 97              | 101             | 104             | 108             | 110             | 112             |
| 176    | 112            | 117            | 101            | 123            | 103            | 121            | 116            | 111            | 106            | 101            | 97              | 95              | 95              | 96              | 99              | 104             | 109             | 113             | 118             | 102             | 123             |
| 178    | 103            | 130            | 134            | 138            | 138            | 134            | 108            | 121            | 113            | 107            | 103             | 100             | 106             | 102             | 106             | 112             | 118             | 105             | 131             | 136             | 138             |
| 180    | 136            | 145            |                |                | *              |                |                | 131            | 12             | 114            | 109             | 106             | 106             | 109             | 114             | 121             | 130             | 139             | 148             | *               | *               |

Appl dC ta t + g      lh unit q l oooo  
 Th T bl    mpl m t y t T bl XLVII It ppl      ti t th S mid t wh h    ppl bl wh th L tit d d i d  
 f m T bl XXX XXXVII H b tw      95 d

# SATELLITE IV

## Tables of the Phenomena

XLVIII

Equation of Semiduration

Sh., Tr.

| M<br>J | 0 <sup>d</sup> | 1 <sup>d</sup> | 2 <sup>d</sup> | 3 <sup>d</sup> | 4 <sup>d</sup> | 5 <sup>d</sup> | 6 <sup>d</sup> | 7 <sup>d</sup> | 8 <sup>d</sup> | 9 <sup>d</sup> | 10 <sup>d</sup> | 11 <sup>d</sup> | 12 <sup>d</sup> | 13 <sup>d</sup> | 14 <sup>d</sup> | 15 <sup>d</sup> | 16 <sup>d</sup> | 17 <sup>d</sup> | 18 <sup>d</sup> | 19 <sup>d</sup> | 20 <sup>d</sup> |
|--------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| d      |                |                |                |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
| 0°0    | 7              | 8              | 9              | 12             | 14             | 17             | 19             | 20             | 21             | 21             | 20              | 18              | 16              | 13              | 11              | 9               | 7               | 7               | 8               | 10              | 12              |
| 0°2    | 9              | 11             | 14             | 16             | 20             | 22             | 23             | 24             | 23             | 21             | 19              | 17              | 14              | 11              | 10              | 9               | 8               | 9               | 11              | 15              | 19              |
| 0°4    | 14             | 18             | 22             | 26             | 28             | 30             | 30             | 29             | 27             | 25             | 22              | 19              | 15              | 14              | 12              | 12              | 13              | 16              | 18              | 23              | 27              |
| 0°6    | 24             | 29             | 34             | 38             | 41             | 41             | 41             | 38             | 35             | 31             | 27              | 23              | 20              | 18              | 17              | 19              | 21              | 25              | 30              | 35              | 40              |
| 0°8    | 37             | 43             | 50             | 54             | 57             | 57             | 55             | 51             | 45             | 39             | 34              | 30              | 27              | 26              | 27              | 29              | 33              | 39              | 45              | 51              | 56              |
| 1°0    | 54             | 61             | 69             | 74             | 77             | 76             | 71             | 65             | 58             | 50             | 44              | 39              | 37              | 36              | 38              | 42              | 49              | 56              | 62              | 71              | 76              |
| 1°2    | 73             | 84             | 93             | *              | *              | *              | 92             | 82             | 72             | 63             | 56              | 51              | 49              | 49              | 53              | 58              | 66              | 76              | 86              | 96              | *               |
| 1°4    | 96             | *              | *              | *              | *              | *              | *              | *              | 89             | 77             | 69              | 63              | 62              | 63              | 68              | 76              | 86              | 100             | *               | *               | *               |
| 1°6    | *              | *              | *              | *              | *              | *              | *              | *              | *              | *              | 84              | 77              | 76              | 78              | 85              | 96              | *               | *               | *               | *               | *               |
| 6°6    | *              | *              | *              | *              | *              | *              | *              | *              | *              | *              | *               | *               | 92              | 87              | *               | *               | *               | *               | *               | *               | *               |
| 6°8    | *              | *              | *              | *              | *              | *              | *              | *              | *              | *              | 91              | 80              | 74              | 72              | 73              | 79              | *               | *               | *               | *               | *               |
| 7°0    | 80             | 90             | *              | *              | *              | *              | *              | *              | 93             | 80             | 72              | 64              | 60              | 59              | 60              | 66              | 73              | 74              | *               | *               | *               |
| 7°2    | 65             | 74             | 79             | 90             | 95             | 94             | 88             | 79             | 69             | 61             | 55              | 48              | 45              | 45              | 48              | 52              | 60              | 68              | 76              | 85              | 91              |
| 7°4    | 52             | 59             | 64             | 69             | 72             | 70             | 65             | 59             | 52             | 44             | 38              | 35              | 34              | 34              | 37              | 41              | 47              | 54              | 61              | 66              | 71              |
| 7°6    | 41             | 46             | 50             | 52             | 53             | 51             | 47             | 42             | 37             | 31             | 27              | 24              | 23              | 25              | 29              | 32              | 37              | 42              | 47              | 51              | 53              |
| 7°8    | 31             | 35             | 37             | 38             | 38             | 35             | 31             | 27             | 23             | 19             | 16              | 15              | 16              | 18              | 22              | 25              | 29              | 33              | 36              | 37              | 38              |
| 8°0    | 25             | 27             | 28             | 27             | 26             | 24             | 20             | 17             | 13             | 11             | 10              | 11              | 12              | 15              | 18              | 21              | 24              | 26              | 27              | 28              | 28              |
| 8°2    | 21             | 22             | 22             | 21             | 18             | 16             | 13             | 11             | 9              | 7              | 8               | 9               | 12              | 15              | 17              | 19              | 21              | 22              | 22              | 22              | 20              |
| 8°4    | 21             | 20             | 19             | 16             | 14             | 11             | 10             | 8              | 7              | 7              | 10              | 12              | 15              | 17              | 19              | 21              | 21              | 21              | 20              | 19              | 16              |
| 8°6    | 23             | 21             | 19             | 16             | 13             | 11             | 9              | 9              | 9              | 12             | 15              | 17              | 21              | 23              | 24              | 25              | 24              | 23              | 21              | 18              | 15              |
| 8°8    | 29             | 25             | 22             | 18             | 16             | 13             | 13             | 14             | 16             | 19             | 23              | 27              | 31              | 32              | 33              | 32              | 30              | 28              | 24              | 20              | 18              |
| 9°0    | 36             | 31             | 27             | 24             | 21             | 20             | 20             | 22             | 26             | 30             | 35              | 40              | 44              | 45              | 45              | 43              | 38              | 35              | 30              | 26              | 23              |
| 9°2    | 46             | 40             | 36             | 31             | 29             | 28             | 30             | 33             | 39             | 46             | 53              | 58              | 62              | 62              | 60              | 56              | 50              | 44              | 39              | 34              | 30              |
| 9°4    | 58             | 51             | 46             | 41             | 40             | 39             | 43             | 48             | 55             | 65             | 73              | 80              | 84              | 82              | 78              | 72              | 64              | 56              | 49              | 44              | 40              |
| 9°6    | 73             | 64             | 57             | 53             | 52             | 53             | 57             | 66             | 74             | 86             | 96              | *               | *               | *               | *               | 90              | 79              | 69              | 62              | 55              | 53              |
| 9°8    | 89             | 79             | 71             | 66             | 66             | 68             | 75             | 84             | 97             | *              | *               | *               | *               | *               | *               | *               | *               | 89              | 79              | 69              | 66              |
| 10°0   | *              | *              | 86             | 81             | 82             | 85             | 95             | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | 83              | 82              |
| 15°0   | *              | *              | *              | 90             | 84             | 83             | 86             | *              | *              | *              | *               | *               | *               | *               | *               | *               | *               | *               | *               | 97              | 88              |
| 15°2   | *              | 92             | 81             | 73             | 69             | 69             | 71             | 78             | 90             | *              | *               | *               | *               | *               | *               | *               | *               | 102             | 88              | 78              | 72              |
| 15°4   | 82             | 72             | 63             | 57             | 54             | 55             | 58             | 64             | 72             | 81             | *               | *               | *               | *               | *               | *               | 90              | 79              | 69              | 61              | 56              |
| 15°6   | 62             | 54             | 47             | 43             | 42             | 42             | 46             | 51             | 58             | 66             | 77              | 81              | 86              | 87              | 83              | 76              | 68              | 59              | 51              | 45              | 43              |
| 15°8   | 44             | 38             | 34             | 31             | 30             | 32             | 35             | 39             | 46             | 52             | 58              | 63              | 65              | 65              | 61              | 56              | 48              | 41              | 36              | 32              | 30              |
| 16°0   | 30             | 25             | 22             | 21             | 21             | 24             | 27             | 31             | 36             | 40             | 44              | 47              | 48              | 47              | 43              | 39              | 33              | 27              | 25              | 23              | 21              |
| 16°2   | 18             | 16             | 14             | 14             | 16             | 18             | 20             | 24             | 28             | 32             | 34              | 35              | 35              | 33              | 30              | 25              | 21              | 18              | 15              | 14              | 14              |
| 16°4   | 11             | 11             | 11             | 11             | 12             | 15             | 18             | 21             | 23             | 25             | 26              | 26              | 24              | 23              | 19              | 15              | 12              | 11              | 9               | 11              | 11              |
| 16°6   | 7              | 8              | 8              | 10             | 13             | 15             | 18             | 20             | 21             | 21             | 21              | 20              | 18              | 15              | 12              | 10              | 9               | 7               | 8               | 9               | 11              |
| 16°8   | 7              | 9              | 11             | 14             | 17             | 20             | 21             | 22             | 22             | 21             | 19              | 17              | 15              | 12              | 10              | 8               | 8               | 9               | 9               | 12              | 15              |
| 17°0   | 12             | 14             | 17             | 21             | 24             | 26             | 27             | 27             | 25             | 23             | 20              | 17              | 14              | 12              | 10              | 10              | 11              | 12              | 15              | 19              | 22              |
| 17°2   | 19             | 23             | 27             | 32             | 34             | 36             | 36             | 34             | 31             | 27             | 24              | 20              | 17              | 15              | 14              | 15              | 17              | 21              | 25              | 29              | 33              |
| 17°4   | 30             | 36             | 42             | 46             | 49             | 50             | 48             | 45             | 40             | 35             | 30              | 27              | 23              | 22              | 22              | 24              | 28              | 32              | 38              | 43              | 48              |
| 17°6   | 46             | 53             | 60             | 65             | 68             | 67             | 63             | 58             | 50             | 45             | 39              | 35              | 32              | 31              | 32              | 36              | 42              | 47              | 55              | 62              | 66              |
| 17°8   | 64             | 73             | 80             | 87             | 90             | 86             | 81             | 75             | 65             | 57             | 50              | 46              | 43              | 43              | 45              | 51              | 58              | 67              | 76              | 83              | 88              |
| 18°0   | 84             | 97             | *              | *              | *              | *              | *              | 92             | 81             | 70             | 62              | 58              | 56              | 57              | 60              | 67              | 78              | 89              | 101             | *               | *               |

Applied Constant : +90.

The unit equals 0<sup>h</sup>00000.

This Table is complementary to Table XLIV. It supplies a correction to the Semiduration which is applicable when the Latitude as derived from Tables XXX-XXXVIII lies between 0°05 and 2°05.

# SATELLITE IV

## Tables of the Phenomena

### Equations of Semiduration

XLIX

| $\alpha$ | Ecl Oc        | $\alpha$ | Ecl Oc        |
|----------|---------------|----------|---------------|
| $\alpha$ |               |          |               |
| 0        | + 0 0 0 5 0   | 2500     | - 0 0 0 0 4 4 |
| 100      | 5 0           | 2600     | 4 0           |
| 200      | 4 8           | 2700     | 3 6           |
| 300      | 4 5           | 2800     | 3             |
| 400      | 4             | 2900     | 2 4           |
| 500      | 3 7           | 3000     | 1 8           |
| 600      | + 0 0 0 0 3   | 3100     | - 0 0 0 0 1 1 |
| 700      | 6             | 3200     | -             |
| 800      | 2 0           | 3300     | +             |
| 900      | 1 3           | 3400     | 1 1           |
| 1000     | +             | 3500     | 1 8           |
| 1100     | - 0 0 0 0 0 1 | 3600     | + 0 0 0 0 4   |
| 1200     | 8             | 3700     | 3 0           |
| 1300     | 1 5           | 3800     | 3 6           |
| 1400     | 2             | 3900     | 4 1           |
| 1500     | 8             | 4000     | 4 4           |
| 1600     | - 0 0 0 0 3 4 | 4100     | +             |
| 1700     | 3 9           | 4200     | 4 9           |
| 1800     | 4 3           | 4300     | 5 0           |
| 1900     | 4 6           | 4400     | 5 0           |
| 2000     | 4 9           | 4500     | 4 9           |
| 2100     | - 0 0 0 0 5 0 | 4600     | +             |
| 2200     | 5 0           | 4700     | 4 3           |
| 2300     | 4 9           | 4800     | 3 9           |
| 2400     | 4 7           | 4900     | 3 4           |
| 2500     | - 0 0 0 0 4 4 | 5000     | + 0 0 0 2 8   |

N C t t h l d d d

L

Ecl, Oc, Sh, Tr

| $\beta$  | L t | 2 5 2 4 2 3 2 2 | 2 1 2 0 1 9 | 1 8 1 7 1 6 | 1 5 | Lat      |
|----------|-----|-----------------|-------------|-------------|-----|----------|
| $\beta$  |     | 0 5 0 6 0 7 0 8 | 0 9 1 0 1 1 | 1 2 1 3 1 4 |     | $\beta$  |
| $\alpha$ |     |                 |             |             |     | $\alpha$ |
| 0        | 10  | 10 10 10 10     | 10 10 10    | 10 10 10 10 |     | 0        |
| 20       | 10  | 11 12 1         | 12 13 13    | 13 13 13 13 |     | 20       |
| 40       | 1   | 12 13 14        | 14 14 15    | 15 15 15 15 |     | 40       |
| 60       | 10  | 13 14 15        | 16 16 16    | 17 17 17 17 |     | 60       |
| 80       | 10  | 13 15 16        | 17 18 18    | 19 19 19 19 |     | 80       |
| 100      | 1   | 14 15 16        | 17 18 18    | 19 19 19 19 |     | 100      |
| 120      | 10  | 13 15 16        | 17 18 18    | 19 19 19 19 |     | 120      |
| 140      | 10  | 13 14 15        | 16 16 16    | 17 17 17 17 |     | 140      |
| 160      | 10  | 12 13 14        | 14 14 15    | 15 15 15 15 |     | 160      |
| 180      | 10  | 11 1 12         | 12 13 13    | 13 13 13 13 |     | 180      |
| 200      | 10  | 10 10 10        | 10 10 10    | 10 10 10 10 |     | 200      |
| 220      | 10  | 9 8 8           | 8 7 7       | 7 7 7 7     |     | 220      |
| 240      | 10  | 8 7 6           | 6 6 5       | 5 5 5 5     |     | 240      |
| 260      | 1   | 7 6 5           | 4 4 4       | 3 3 3 3     |     | 260      |
| 280      | 10  | 7 5 4           | 3 2         | 1 1 1 1     |     | 280      |
| 300      | 10  | 6 5 4           | 3 2         | 1 1 1 1     |     | 300      |
| 320      | 10  | 7 5 4           | 3 2         | 1 1 1 1     |     | 320      |
| 340      | 10  | 7 6 5           | 4 4 4       | 3 3 3 3     |     | 340      |
| 360      | 10  | 8 7 6           | 6 6 6       | 5 5 5 5     |     | 360      |
| 380      | 10  | 9 8 8           | 8 7 7       | 7 7 7 7     |     | 380      |
| 400      | 10  | 10 10 10        | 10 10 10    | 10 10 10 10 |     | 400      |

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| $\beta$ | Lat                       | 2 4 8 2 4 6 2 4 4        | 2 4 2 2 4 0 2 3 8      | 2 3 6 2 3 4 2 3 2      | 2 3 0 2 2 0 2 1 0      | 2 0 0 1 9 0 1 8 0      | 1 7 0 1 6 0 | 15 0 | Lat     |
|---------|---------------------------|--------------------------|------------------------|------------------------|------------------------|------------------------|-------------|------|---------|
|         |                           | 0 5 2 0 5 4 0 5 6        | 0 5 8 0 6 0 0 6 2      | 0 6 4 0 6 6 0 6 8      | 0 7 0 0 8 0 0 9 0      | 1 0 0 1 1 0 1 2 0      | 1 3 0 1 4 0 |      | $\beta$ |
| a       |                           |                          |                        |                        |                        |                        |             |      | a       |
| 0       | $\pm 236 \pm 168 \pm 138$ | $\pm 110 \pm 108 \pm 99$ | $\pm 9 \pm 87 \pm 82$  | $\pm 78 \pm 66 \pm 59$ | $\pm 54 \pm 51 \pm 49$ | $\pm 48 \pm 47 \pm 47$ |             | 0    |         |
| 20      | 2 4 160 131               | 114 103 94               | 88 82 78               | 74 63 56               | 52 49 47               | 46 45 45               |             | 20   |         |
| 40      | 191 136 111               | 97 87 80                 | 74 7 66                | 63 53 48               | 44 41 4                | 39 38 38               |             | 40   |         |
| 60      | 136 96 79                 | 69 6 57                  | 53 5 47                | 45 38 34               | 31 29 28               | 28 27 7                |             | 60   |         |
| 80      | $\pm 70 \pm 50 \pm 41$    | $\pm 36 \pm 3 \pm 30$    | $\pm 27 \pm 6 \pm 25$  | $\pm 24 \pm 0 \pm 18$  | $\pm 16 \pm 15 \pm 15$ | $\pm 14 \pm 14 \pm 14$ |             | 80   |         |
| 100     | $\mp \mp \mp 2 \mp 1$     | $\mp \mp \mp 1 \mp 1$    | $\mp \mp \mp 1 \mp 1$  | $\mp \mp \mp 1 \mp 1$  | $\mp \mp \mp 1 \mp 1$  | $\mp \mp \mp 1 \mp 1$  |             | 100  |         |
| 120     | $\mp 73 \mp 53 \mp 43$    | $\mp 38 \mp 34 \mp 3$    | $\mp 29 \mp 27 \mp 26$ | $\mp 5 \mp 21 \mp 19$  | $\mp 17 \mp 16 \mp 16$ | $\mp 15 \mp 15 \mp 15$ |             | 120  |         |
| 140     | 138 98 81                 | 70 63 58                 | 54 51 48               | 46 39 35               | 3 3 29                 | 29 28 28               |             | 140  |         |
| 160     | 191 136 111               | 97 87 80                 | 74 70 66               | 63 53 48               | 44 41 40               | 39 38 38               |             | 160  |         |
| 180     | 2 4 160 131               | 114 103 94               | 88 82 78               | 74 63 56               | 52 49 47               | 46 45 45               |             | 180  |         |
| 200     | 36 168 138                | 1 108 99                 | 92 87 82               | 78 66 59               | 54 51 49               | 48 47 47               |             | 200  |         |
| 220     | $\mp 4 \mp 16 \mp 131$    | $\mp 114 \mp 103 \mp 94$ | $\mp 88 \mp 82 \mp 78$ | $\mp 74 \mp 63 \mp 56$ | $\mp 52 \mp 49 \mp 47$ | $\mp 46 \mp 45 \mp 45$ |             | 220  |         |
| 240     | 191 136 111               | 97 87 8                  | 74 70 66               | 63 53 48               | 44 41 40               | 39 38 38               |             | 240  |         |
| 260     | 136 96 79                 | 69 6 57                  | 53 50 47               | 45 38 34               | 31 9 28                | 29 28 27               |             | 260  |         |
| 280     | $\mp 70 \mp 5 \mp 41$     | $\mp 36 \mp 32 \mp 30$   | $\mp 27 \mp 26 \mp 25$ | $\mp 24 \mp 20 \mp 18$ | $\mp 16 \mp 15 \mp 15$ | $\mp 14 \mp 14 \mp 14$ |             | 280  |         |
| 300     | $\pm 2 \pm 1 \pm 1$       | $\pm 1 \pm 1 \pm 1$      | $\pm 1 \pm 1 \pm 1$    | $\pm 1 \pm 1 \pm 1$    | $\pm 1 \pm 1 \pm 1$    | $\pm 1 \pm 1 \pm 1$    |             | 300  |         |
| 320     | $\pm 73 \pm 53 \pm 43$    | $\pm 38 \pm 34 \pm 32$   | $\pm 29 \pm 27 \pm 26$ | $\pm 5 \pm 1 \pm 19$   | $\pm 17 \pm 16 \pm 16$ | $\pm 15 \pm 15 \pm 15$ |             | 320  |         |
| 340     | 138 98 81                 | 70 63 58                 | 54 51 48               | 46 39 35               | 3 30 29                | 9 8 28                 |             | 340  |         |
| 360     | 191 136 111               | 97 87 80                 | 74 70 66               | 63 53 48               | 44 41 40               | 39 38 38               |             | 360  |         |
| 380     | 4 6 131                   | 114 1 3 94               | 88 82 78               | 74 63 56               | 52 49 47               | 46 45 45               |             | 380  |         |
| 400     | $\pm 36 \pm 168 \pm 138$  | $\pm 120 \pm 108 \pm 99$ | $\pm 9 \pm 87 \pm 82$  | $\pm 78 \pm 66 \pm 59$ | $\pm 54 \pm 51 \pm 49$ | $\pm 48 \pm 47 \pm 47$ |             | 400  |         |

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# SATELLITE IV

## Tables of the Phenomena

LII

Reductions to Middle

Argument J

| 1              | 2        | 3                     | 4   | 5              | 6        | 7                     |
|----------------|----------|-----------------------|-----|----------------|----------|-----------------------|
| Ecl., Oc.      | $\Delta$ | $\frac{1}{2}\Delta^2$ | J   | Sh., Tr.       | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| d<br>-0'000928 | -213     | 0                     | 0'0 | d<br>-0'001072 | -288     | 0                     |
| 1141           | 213      | +1                    | 0'1 | 1360           | 288      | +1                    |
| 1353           | 211      | 1                     | 0'2 | 1647           | 286      | 2                     |
| 1563           | 208      | 2                     | 0'3 | 1931           | 281      | 3                     |
| 1768           | 204      | 2                     | 0'4 | 2208           | 275      | 3                     |
| 1970           | 199      | 3                     | 0'5 | 2481           | 268      | 4                     |
| -0'002165      | -192     | +4                    | 0'6 | -0'002745      | -259     | +5                    |
| 2353           | 184      | 4                     | 0'7 | 2999           | 249      | 6                     |
| 2533           | 176      | 5                     | 0'8 | 3242           | 237      | 6                     |
| 2704           | 166      | 5                     | 0'9 | 3473           | 225      | 7                     |
| 2865           | 156      | 5                     | 1'0 | 3692           | 211      | 8                     |
| -0'003015      | -145     | +6                    | 1'1 | -0'003895      | -195     | +8                    |
| 3154           | 132      | 7                     | 1'2 | 4081           | 178      | 9                     |
| 3279           | 119      | 7                     | 1'3 | 4251           | 161      | 9                     |
| 3391           | 106      | 7                     | 1'4 | 4403           | 143      | 10                    |
| 3490           | 91       | 8                     | 1'5 | 4536           | 123      | 10                    |
| -0'003573      | -76      | +7                    | 1'6 | -0'004649      | -103     | +10                   |
| 3642           | 62       | 8                     | 1'7 | 4742           | 83       | 10                    |
| 3696           | 46       | 8                     | 1'8 | 4815           | 62       | 11                    |
| 3733           | 30       | 8                     | 1'9 | 4865           | 40       | 11                    |
| 3755           | -14      | 8                     | 2'0 | 4895           | -19      | 11                    |
| -0'003761      | +2       | +8                    | 2'1 | -0'004903      | +3       | +11                   |
| 3751           | 18       | 8                     | 2'2 | 4889           | 25       | 11                    |
| 3725           | 35       | 8                     | 2'3 | 4854           | 47       | 11                    |
| 3682           | 51       | 8                     | 2'4 | 4796           | 68       | 10                    |
| 3624           | 65       | 7                     | 2'5 | 4718           | 88       | 10                    |
| -0'003552      | +80      | +7                    | 2'6 | -0'004620      | +109     | +10                   |
| 3464           | 96       | 7                     | 2'7 | 4501           | 129      | 10                    |
| 3361           | 109      | 7                     | 2'8 | 4363           | 148      | 9                     |
| 3246           | 122      | 7                     | 2'9 | 4205           | 166      | 9                     |
| 3117           | 136      | 7                     | 3'0 | 4031           | 183      | 8                     |
| -0'002975      | +148     | +6                    | 3'1 | -0'003839      | +199     | +8                    |
| 2822           | 159      | 5                     | 3'2 | 3633           | 214      | 8                     |
| 2658           | 169      | 4                     | 3'3 | 3411           | 229      | 7                     |
| 2484           | 176      | 5                     | 3'4 | 3176           | 241      | 6                     |
| 2302           | 187      | 5                     | 3'5 | 2929           | 252      | 5                     |
| -0'002111      | +194     | +3                    | 3'6 | -0'002672      | +262     | +5                    |
| 1914           | 200      | 3                     | 3'7 | 2406           | 270      | 4                     |
| 1712           | 205      | 2                     | 3'8 | 2132           | 277      | 3                     |
| 1505           | 209      | 2                     | 3'9 | 1852           | 283      | 2                     |
| 1294           | 212      | +1                    | 4'0 | 1567           | 286      | +1                    |
| -0'001082      | +213     | 0                     | 4'1 | -0'001280      | +288     | 0                     |
| 868            | 213      | 0                     | 4'2 | 992            | 288      | 0                     |
| 656            | 212      | -1                    | 4'3 | 704            | 287      | -1                    |
| 445            | 210      | 1                     | 4'4 | 418            | 284      | 2                     |
| 237            | 207      | 2                     | 4'5 | -              | 136      | 3                     |
| -0'000031      | +203     | -3                    | 4'6 | +0'000141      | +273     | -4                    |
| +168           | 197      | 3                     | 4'7 | 410            | 266      | 4                     |
| 362            | 190      | 4                     | 4'8 | 672            | 257      | 5                     |
| 548            | 182      | 4                     | 4'9 | 924            | 246      | 6                     |
| +0'000726      | +173     | -5                    | 5'0 | +0'001164      | +234     | -6                    |

| 1              | 2        | 3                     | 4    | 5              | 6        | 7                     |
|----------------|----------|-----------------------|------|----------------|----------|-----------------------|
| Ecl., Oc.      | $\Delta$ | $\frac{1}{2}\Delta^2$ | J    | Sh., Tr.       | $\Delta$ | $\frac{1}{2}\Delta^2$ |
| d<br>+0'000726 | +173     | -5                    | 5'0  | d<br>+0'001164 | +234     | -6                    |
| 894            | 163      | 5                     | 5'1  | 1392           | 221      | 7                     |
| 1052           | 153      | 6                     | 5'2  | 1606           | 206      | 8                     |
| 1199           | 141      | 6                     | 5'3  | 1804           | 190      | 8                     |
| 1334           | 129      | 7                     | 5'4  | 1986           | 173      | 9                     |
| 1456           | 115      | 7                     | 5'5  | 2150           | 156      | 9                     |
| +0'001564      | +102     | -7                    | 5'6  | +0'002298      | +138     | -10                   |
| 1659           | 87       | 8                     | 5'7  | 2425           | 118      | 10                    |
| 1738           | 72       | 8                     | 5'8  | 2533           | 98       | 10                    |
| 1803           | 57       | 8                     | 5'9  | 2620           | 77       | 11                    |
| 1852           | 41       | 8                     | 6'0  | 2687           | 56       | 11                    |
| +0'001885      | +25      | -8                    | 6'1  | +0'002732      | +34      | -11                   |
| 1902           | +10      | 8                     | 6'2  | 2755           | +13      | 11                    |
| 1904           | -7       | 8                     | 6'3  | 2757           | -9       | 11                    |
| 1889           | 23       | 8                     | 6'4  | 2738           | 31       | 11                    |
| 1858           | 39       | 8                     | 6'5  | 2696           | 53       | 11                    |
| +0'001812      | -55      | -8                    | 6'6  | +0'002633      | -74      | -10                   |
| 1749           | 70       | 7                     | 6'7  | 2549           | 94       | 10                    |
| 1673           | 84       | 7                     | 6'8  | 2445           | 115      | 10                    |
| 1581           | 99       | 7                     | 6'9  | 2320           | 135      | 10                    |
| 1475           | 113      | 7                     | 7'0  | 2176           | 153      | 9                     |
| +0'001355      | -127     | -7                    | 7'1  | +0'002015      | -171     | -9                    |
| 1222           | 139      | 6                     | 7'2  | 1835           | 187      | 8                     |
| 1077           | 151      | 6                     | 7'3  | 1640           | 203      | 8                     |
| 921            | 162      | 5                     | 7'4  | 1428           | 219      | 7                     |
| 754            | 172      | 5                     | 7'5  | 1203           | 232      | 6                     |
| +0'000578      | -180     | -4                    | 7'6  | +0'000965      | -244     | -6                    |
| 394            | 189      | 4                     | 7'7  | 715            | 255      | 5                     |
| 201            | 196      | 3                     | 7'8  | 455            | 265      | 5                     |
| +2             | 202      | 3                     | 7'9  | +186           | 273      | 3                     |
| -202           | 206      | 2                     | 8'0  | -90            | 279      | 2                     |
| -0'000409      | -209     | -2                    | 8'1  | -0'000371      | -283     | -2                    |
| 620            | 212      | -1                    | 8'2  | 656            | 287      | -1                    |
| 833            | 213      | 0                     | 8'3  | 944            | 288      | 0                     |
| 1046           | 213      | 0                     | 8'4  | 1232           | 288      | 0                     |
| 1259           | 212      | +1                    | 8'5  | 1520           | 287      | +1                    |
| -0'001470      | -210     | +1                    | 8'6  | -0'001805      | -283     | +2                    |
| 1678           | 206      | 3                     | 8'7  | 2086           | 278      | 3                     |
| 1881           | 200      | 3                     | 8'8  | 2360           | 271      | 4                     |
| 2078           | 195      | 3                     | 8'9  | 2628           | 264      | 4                     |
| 2270           | 188      | 4                     | 9'0  | 2887           | 254      | 5                     |
| -0'002454      | -180     | +4                    | 9'1  | -0'003136      | -243     | +6                    |
| 2629           | 171      | 5                     | 9'2  | 3372           | 230      | 6                     |
| 2795           | 161      | 5                     | 9'3  | 3596           | 218      | 7                     |
| 2950           | 150      | 6                     | 9'4  | 3807           | 202      | 8                     |
| 3094           | 138      | 6                     | 9'5  | 3999           | 186      | 8                     |
| -0'003225      | -125     | +7                    | 9'6  | -0'004178      | -170     | +9                    |
| 3343           | 112      | 7                     | 9'7  | 4338           | 151      | 10                    |
| 3448           | 98       | 7                     | 9'8  | 4480           | 132      | 10                    |
| 3538           | 83       | 8                     | 9'9  | 4601           | 112      | 10                    |
| -0'003614      | -68      | +8                    | 10'0 | -0'004703      | -92      | +10                   |

Applied Constant: -0'000000.

This Table includes a constant portion of the Equation of Light.

The Entry must be

Supplemented by the Equations from Tables LIII-LX.

The whole must be corrected by adding to it its product by the Variation, as drawn from

Tables XXVI-XXIX.

For Shadows and Transits it must also be corrected for Jupiter's Phase by Table LXI.

# SATELLITE IV

## Tables of the Phenomena

LII—continued

Reductions to Middle

Argument J

| Ecl Oc                   | $\Delta$ | $\frac{1}{2}\Delta^2$ | J                          | Sh I     | $\Delta$ | $\frac{1}{2}\Delta^2$ |
|--------------------------|----------|-----------------------|----------------------------|----------|----------|-----------------------|
| <sup>d</sup><br>-0003614 | - 68     | + 8                   | <sup>d</sup><br><b>100</b> | -0004703 | - 92     | +10                   |
| 3674                     | 53       | 8                     | <b>101</b>                 | 4785     | 7        | 11                    |
| 3719                     | 37       | 8                     | <b>102</b>                 | 4846     | 50       | 11                    |
| 3748                     | 21       | 8                     | <b>103</b>                 | 4885     | 8        | 11                    |
| 3761                     | - 5      | 8                     | <b>104</b>                 | 4903     | - 7      | 11                    |
| 3758                     | +11      | 8                     | <b>105</b>                 | 4898     | +15      | 11                    |
| -0003739                 | + 8      | + 8                   | <b>106</b>                 | -0004872 | + 36     | +11                   |
| 3703                     | 44       | 8                     | <b>107</b>                 | 4826     | 58       | 11                    |
| 3651                     | 59       | 7                     | <b>108</b>                 | 4755     | 79       | 1                     |
| 3586                     | 73       | 7                     | <b>109</b>                 | 4666     | 99       | 10                    |
| 3505                     | 88       | 8                     | <b>110</b>                 | 4558     | 120      | 10                    |
| -0003410                 | +103     | + 7                   | <b>111</b>                 | -0004477 | +140     | +10                   |
| 399                      | 117      | 7                     | <b>112</b>                 | 478      | 158      | 9                     |
| 3176                     | 130      | 7                     | <b>113</b>                 | 4111     | 176      | 9                     |
| 340                      | 143      | 6                     | <b>114</b>                 | 397      | 19       | 8                     |
| 2891                     | 154      | 5                     | <b>115</b>                 | 377      | 208      | 7                     |
| -00073                   | +164     | + 5                   | <b>116</b>                 | -0003511 | +21      | + 7                   |
| 2563                     | 174      | 5                     | <b>117</b>                 | 3283     | 235      | 7                     |
| 384                      | 183      | 4                     | <b>118</b>                 | 3041     | 248      | 6                     |
| 197                      | 191      | 4                     | <b>119</b>                 | 787      | 58       | 5                     |
| 03                       | 197      | 3                     | <b>120</b>                 | 55       | 266      | 4                     |
| -0001803                 | +203     | + 3                   | <b>121</b>                 | -000255  | + 73     | + 4                   |
| 1598                     | 8        |                       | <b>122</b>                 | 1978     | 280      | 3                     |
| 1388                     | 11       | + 1                   | <b>123</b>                 | 1695     | 85       |                       |
| 1176                     | 13       | 0                     | <b>124</b>                 | 1409     | 287      | + 1                   |
| 963                      | 13       | 0                     | <b>125</b>                 | 11       | 288      |                       |
| -000075                  | + 1      | - 1                   | <b>126</b>                 | -00083   | + 88     | 0                     |
| 539                      | 211      | 1                     | <b>127</b>                 | 545      | 86       | - 1                   |
| 38                       | 09       |                       | <b>128</b>                 | 61       | 8        | 2                     |
| - 1                      | 24       |                       | <b>129</b>                 | + 18     | 277      | 3                     |
| + 8                      | 200      | 3                     | <b>130</b>                 | 9        | 70       | 4                     |
| +0000277                 | +193     | - 4                   | <b>131</b>                 | +000557  | +261     | - 5                   |
| 466                      | 186      | 4                     | <b>132</b>                 | 814      | 51       | 6                     |
| 648                      | 178      | 5                     | <b>133</b>                 | 1059     | 39       | 6                     |
| 81                       | 168      | 5                     | <b>134</b>                 | 19       | 227      | 7                     |
| 983                      | 158      | 6                     | <b>135</b>                 | 1513     | 213      | 7                     |
| +0001136                 | +146     | - 6                   | <b>136</b>                 | +0001718 | +198     | - 8                   |
| 1275                     | 134      | 6                     | <b>137</b>                 | 1908     | 181      | 9                     |
| 1404                     | 12       | 7                     | <b>138</b>                 | 80       | 164      | 9                     |
| 1518                     | 108      | 7                     | <b>139</b>                 | 235      | 146      | 9                     |
| 169                      | 94       | 7                     | <b>140</b>                 | 2371     | 127      | 10                    |
| +000175                  | + 79     | - 8                   | <b>141</b>                 | +000488  | +107     | -10                   |
| 1776                     | 64       | 8                     | <b>142</b>                 | 2584     | 86       | 10                    |
| 183                      | 48       | 8                     | <b>143</b>                 | 266      | 66       | 11                    |
| 1873                     | 33       | 8                     | <b>144</b>                 | 715      | 44       | 11                    |
| 1897                     | +16      | 8                     | <b>145</b>                 | 748      | + 2      | 11                    |
| +000195                  | 0        | - 8                   | <b>146</b>                 | +000759  |          | -11                   |
| 1897                     | -15      | 8                     | <b>147</b>                 | 2749     | - 21     | 11                    |
| 1875                     | 31       | 8                     | <b>148</b>                 | 717      | 43       | 11                    |
| 1835                     | 48       | 8                     | <b>149</b>                 | 2664     | 64       | 11                    |
| +001779                  | - 63     | - 8                   | <b>150</b>                 | +00589   | - 86     | -11                   |

| Ecl Oc                  | $\Delta$ | $\frac{1}{2}\Delta^2$ | J                          | Sh T     | $\Delta$ | $\frac{1}{2}\Delta^2$ |
|-------------------------|----------|-----------------------|----------------------------|----------|----------|-----------------------|
| <sup>d</sup><br>+001779 | - 63     | - 8                   | <sup>d</sup><br><b>150</b> | +0002589 | - 86     | -11                   |
| 179                     | 78       | 8                     | <b>151</b>                 | 2493     | 106      | 10                    |
| 1624                    | 93       | 7                     | <b>152</b>                 | 2378     | 15       | 10                    |
| 154                     | 107      | 7                     | <b>153</b>                 | 2244     | 145      | 10                    |
| 1411                    | 11       | 7                     | <b>154</b>                 | 089      | 164      | 9                     |
| 1283                    | 13       | 6                     | <b>155</b>                 | 1917     | 180      | 8                     |
| +001145                 | -146     | - 6                   | <b>156</b>                 | +0001730 | -196     | - 8                   |
| 992                     | 158      | 5                     | <b>157</b>                 | 1525     | 213      | 8                     |
| 830                     | 169      | 5                     | <b>158</b>                 | 1305     | 6        | 7                     |
| 657                     | 177      | 4                     | <b>159</b>                 | 1073     | 239      | 6                     |
| 477                     | 185      | 4                     | <b>160</b>                 | 88       | 251      | 6                     |
| +0000288                | -193     | - 4                   | <b>161</b>                 | +000057  | -261     | - 5                   |
| + 91                    | 199      | 3                     | <b>162</b>                 | 37       | 69       | 4                     |
| - 110                   | 04       |                       | <b>163</b>                 | + 34     | 76       | 3                     |
| 316                     | 208      |                       | <b>164</b>                 | - 245    | 8        | 3                     |
| 56                      | 21       | - 1                   | <b>165</b>                 | 59       | 86       | 2                     |
| -0000739                | -213     | 0                     | <b>166</b>                 | -0000816 | -288     | - 1                   |
| 952                     | 213      | 0                     | <b>167</b>                 | 1104     | 288      | 0                     |
| 1165                    | 1        | + 1                   | <b>168</b>                 | 139      | 288      | + 1                   |
| 1377                    | 10       | 1                     | <b>169</b>                 | 1679     | 285      | 2                     |
| 1585                    | 207      | 2                     | <b>170</b>                 | 1962     | 280      | 3                     |
| -0001791                | - 03     | + 2                   | <b>171</b>                 | -000238  | -274     | + 3                   |
| 1991                    | 198      | 3                     | <b>172</b>                 | 2510     | 268      | 4                     |
| 186                     | 191      | 4                     | <b>173</b>                 | 2773     | 59       | 5                     |
| 373                     | 183      | 4                     | <b>174</b>                 | 3027     | 248      | 6                     |
| 552                     | 175      | 4                     | <b>175</b>                 | 3269     | 36       | 6                     |
| -0007                   | -166     | + 5                   | <b>176</b>                 | -0003498 | - 3      | + 7                   |
| 883                     | 156      | 6                     | <b>177</b>                 | 3715     | 210      | 7                     |
| 3033                    | 143      | 7                     | <b>178</b>                 | 3917     | 194      | 8                     |
| 3168                    | 130      | 7                     | <b>179</b>                 | 4103     | 177      | 9                     |
| 3292                    | 118      | 7                     | <b>180</b>                 | 4270     | 159      | 9                     |
| -0003403                | -104     | + 7                   | <b>181</b>                 | -0004420 | -140     | +10                   |
| 3500                    | 90       | 7                     | <b>182</b>                 | 4550     | 120      | 10                    |
| 3582                    | 75       | 8                     | <b>183</b>                 | 4660     | 101      | 10                    |
| 365                     | 60       | 8                     | <b>184</b>                 | 4751     | 81       | 10                    |
| 3702                    | 43       | 8                     | <b>185</b>                 | 48       | 60       | 11                    |
| -003736                 | - 7      | + 8                   | <b>186</b>                 | -0004870 | - 38     | +11                   |
| 3755                    | -13      | 8                     | <b>187</b>                 | 4898     | -17      | 11                    |
| 3761                    | + 3      | 8                     | <b>188</b>                 | 4904     | + 5      | 11                    |
| 375                     | 20       | 8                     | <b>189</b>                 | 4887     | 27       | 11                    |
| 37                      | 37       | 8                     | <b>190</b>                 | 4849     | 49       | 11                    |
| -003676                 | + 53     | + 7                   | <b>191</b>                 | -0004790 | + 71     | +11                   |
| 3617                    | 67       | 7                     | <b>192</b>                 | 4708     | 91       | 10                    |
| 354                     | 8        | 7                     | <b>193</b>                 | 4608     | 111      | 10                    |
| 3453                    | 97       | 7                     | <b>194</b>                 | 4487     | 131      | 10                    |
| 3349                    | 111      | 7                     | <b>195</b>                 | 4347     | 150      | 9                     |
| -000332                 | +14      | + 6                   | <b>196</b>                 | -0004188 | +168     | + 9                   |
| 311                     | 137      | 6                     | <b>197</b>                 | 4011     | 185      | 8                     |
| 2958                    | 149      | 6                     | <b>198</b>                 | 3818     | 201      | 8                     |
| 2804                    | 160      | 5                     | <b>199</b>                 | 369      | 216      | 7                     |
| -000639                 | +17      | + 5                   | <b>200</b>                 | -0003387 | +228     | + 6                   |

Appl dC t t oo Th T bl 1 d t tp t fth Eq ti fLight Th Etym tb  
 ppl m t d by th Eq t f m T bl LXX LX Th whl m tb t d by d d i g t t p d t by th V i t d w n f m  
 T bl XXVI XXIX F Sh d w d T it it m t l b corr t d f J pit Ph ly T bl LXI

# SATELLITE IV

## Tables of the Phenomena

**LIII**

**Reductions to Middle**

**Argument K**

| 1             | 2        | 3        | 4        | 5        |
|---------------|----------|----------|----------|----------|
| Ecl., Oc.     | $\Delta$ | <b>K</b> | Sh., Tr. | $\Delta$ |
| d<br>0'000750 | - 47     | 0'0      | 0'000750 | - 55     |
| 703           | 47       | 0'1      | 696      | 55       |
| 656           | 47       | 0'2      | 641      | 54       |
| 610           | 46       | 0'3      | 587      | 54       |
| 564           | 45       | 0'4      | 534      | 53       |
| 520           | 44       | 0'5      | 482      | 51       |
| 0'000477      | - 43     | 0'6      | 0'000432 | - 49     |
| 435           | 41       | 0'7      | 384      | 47       |
| 395           | 39       | 0'8      | 338      | 45       |
| 357           | 37       | 0'9      | 294      | 43       |
| 322           | 34       | 1'0      | 252      | 40       |
| 0'000289      | - 32     | 1'1      | 0'000214 | - 37     |
| 258           | 30       | 1'2      | 179      | 34       |
| 230           | 26       | 1'3      | 146      | 31       |
| 206           | 23       | 1'4      | 117      | 27       |
| 184           | 21       | 1'5      | 92       | 23       |
| 0'000165      | - 17     | 1'6      | 0'000071 | - 20     |
| 150           | 14       | 1'7      | 53       | 16       |
| 138           | 10       | 1'8      | 39       | 12       |
| 130           | 7        | 1'9      | 29       | 8        |
| 125           | - 3      | 2'0      | 24       | - 3      |
| 0'000124      | 0        | 2'1      | 0'000023 | + 1      |
| 126           | + 4      | 2'2      | 26       | 5        |
| 132           | 8        | 2'3      | 32       | 9        |
| 141           | 11       | 2'4      | 43       | 13       |
| 154           | 15       | 2'5      | 58       | 17       |
| 0'000170      | + 18     | 2'6      | 0'000076 | + 21     |
| 189           | 21       | 2'7      | 99       | 25       |
| 212           | 25       | 2'8      | 125      | 28       |
| 238           | 28       | 2'9      | 155      | 32       |
| 267           | 30       | 3'0      | 188      | 35       |
| 0'000298      | + 33     | 3'1      | 0'000225 | + 39     |
| 332           | 35       | 3'2      | 264      | 41       |
| 368           | 37       | 3'3      | 306      | 43       |
| 406           | 39       | 3'4      | 350      | 46       |
| 446           | 41       | 3'5      | 397      | 48       |
| 0'000488      | + 43     | 3'6      | 0'000446 | + 50     |
| 532           | 45       | 3'7      | 497      | 52       |
| 577           | 46       | 3'8      | 549      | 53       |
| 623           | 46       | 3'9      | 602      | 54       |
| 669           | 47       | 4'0      | 656      | 54       |
| 0'000716      | + 47     | 4'1      | 0'000710 | + 55     |
| 763           | 47       | 4'2      | 765      | 55       |
| 810           | 47       | 4'3      | 820      | 55       |
| 857           | 47       | 4'4      | 874      | 54       |
| 903           | 46       | 4'5      | 928      | 54       |
| 0'000948      | + 45     | 4'6      | 0'000981 | + 52     |
| 992           | 44       | 4'7      | 1032     | 50       |
| 1035          | 42       | 4'8      | 1081     | 48       |
| 1076          | 40       | 4'9      | 1129     | 47       |
| 0'001115      | + 39     | 5'0      | 0'001175 | + 45     |

| 1             | 2        | 3        | 4        | 5        |
|---------------|----------|----------|----------|----------|
| Ecl., Oc.     | $\Delta$ | <b>K</b> | Sh., Tr. | $\Delta$ |
| d<br>0'001115 | + 39     | 5'0      | 0'001175 | + 45     |
| 1153          | 37       | 5'1      | 1218     | 42       |
| 1188          | 34       | 5'2      | 1259     | 39       |
| 1220          | 31       | 5'3      | 1296     | 36       |
| 1250          | 29       | 5'4      | 1331     | 33       |
| 1277          | 26       | 5'5      | 1362     | 30       |
| 0'001301      | + 23     | 5'6      | 0'001390 | + 26     |
| 1322          | 20       | 5'7      | 1414     | 23       |
| 1340          | 16       | 5'8      | 1435     | 19       |
| 1354          | 13       | 5'9      | 1451     | 15       |
| 1305          | 9        | 6'0      | 1464     | 11       |
| 0'001372      | + 5      | 6'1      | 0'001473 | + 7      |
| 1375          | + 2      | 6'2      | 1477     | + 2      |
| 1376          | - 1      | 6'3      | 1477     | - 2      |
| 1373          | 5        | 6'4      | 1474     | 6        |
| 1366          | 9        | 6'5      | 1466     | 10       |
| 0'001356      | - 12     | 6'6      | 0'001454 | - 14     |
| 1342          | 16       | 6'7      | 1438     | 18       |
| 1325          | 19       | 6'8      | 1418     | 22       |
| 1305          | 22       | 6'9      | 1394     | 26       |
| 1281          | 25       | 7'0      | 1367     | 29       |
| 0'001255      | - 28     | 7'1      | 0'001336 | - 33     |
| 1226          | 31       | 7'2      | 1302     | 36       |
| 1194          | 34       | 7'3      | 1265     | 39       |
| 1159          | 36       | 7'4      | 1225     | 42       |
| 1122          | 38       | 7'5      | 1182     | 44       |
| 0'001083      | - 40     | 7'6      | 0'001137 | - 47     |
| 1042          | 42       | 7'7      | 1089     | 49       |
| 1000          | 43       | 7'8      | 1040     | 50       |
| 956           | 45       | 7'9      | 989      | 52       |
| 910           | 46       | 8'0      | 936      | 53       |
| 0'000864      | - 46     | 8'1      | 0'000883 | - 54     |
| 818           | 47       | 8'2      | 829      | 55       |
| 771           | 47       | 8'3      | 774      | 55       |
| 724           | 47       | 8'4      | 719      | 55       |
| 677           | 47       | 8'5      | 665      | 55       |
| 0'000630      | - 47     | 8'6      | 0'000610 | - 54     |
| 584           | 46       | 8'7      | 557      | 53       |
| 539           | 45       | 8'8      | 505      | 52       |
| 495           | 43       | 8'9      | 454      | 50       |
| 453           | 42       | 9'0      | 405      | 48       |
| 0'000412      | - 40     | 9'1      | 0'000358 | - 46     |
| 373           | 38       | 9'2      | 313      | 44       |
| 337           | 35       | 9'3      | 270      | 42       |
| 303           | 33       | 9'4      | 230      | 38       |
| 272           | 31       | 9'5      | 194      | 35       |
| 0'000242      | - 28     | 9'6      | 0'000160 | - 32     |
| 216           | 25       | 9'7      | 130      | 29       |
| 192           | 22       | 9'8      | 103      | 25       |
| 172           | 18       | 9'9      | 80       | 22       |
| 0'000156      | - 14     | 10'0     | 0'000060 | - 18     |

Applied Constant:  $+0^{\circ}000750$ .

# SATELLITE IV

## Tables of the Phenomena

### Reductions to Middle

LIV

| Ecl      | Oc | $\Delta$<br>o <sup>d</sup> | 3<br>L | 4<br>Sh Tr               | 5<br>$\Delta$<br>o |
|----------|----|----------------------------|--------|--------------------------|--------------------|
| 0 000100 | +6 |                            | 00     | <sup>a</sup><br>0 000100 | +6                 |
| 111      | 5  |                            | 02     | 11                       | 6                  |
| 1 0      | 5  |                            | 04     | 1 4                      | 6                  |
| 13       | 5  |                            | 06     | 135                      | 5                  |
| 139      | 4  |                            | 08     | 145                      | 5                  |
| 146      | 4  |                            | 10     | 154                      | 4                  |
| 000153   | +3 |                            | 12     | 0 000162                 | +4                 |
| 159      | 3  |                            | 14     | 169                      | 3                  |
| 164      |    |                            | 16     | 174                      |                    |
| 167      | +1 |                            | 18     | 178                      | 2                  |
| 168      |    |                            | 20     | 180                      | +1                 |
| 0 000168 | -1 |                            | 22     | 0 000180                 | -1                 |
| 166      | 1  |                            | 24     | 177                      |                    |
| 163      | 2  |                            | 26     | 174                      |                    |
| 158      | 3  |                            | 28     | 168                      | 3                  |
| 153      | 3  |                            | 30     | 161                      | 4                  |
| 00146    | -4 |                            | 32     | 0 000152                 | -5                 |
| 138      | 5  |                            | 34     | 143                      | 5                  |
| 1 8      | 5  |                            | 36     | 133                      | 5                  |
| 118      | 5  |                            | 38     | 122                      | 6                  |
| 109      | 5  |                            | 40     | 111                      | 6                  |
| 0 000098 | -5 |                            | 42     | 0 000098                 | -6                 |
| 89       | 5  |                            | 44     | 86                       | 6                  |
| 78       | 5  |                            | 46     | 75                       | 6                  |
| 69       | 5  |                            | 48     | 64                       | 5                  |
| 60       | 4  |                            | 50     | 54                       | 5                  |
| 0 000053 | -4 |                            | 52     | 0 000045                 | -5                 |
| 46       | 3  |                            | 54     | 36                       | 4                  |
| 40       | 3  |                            | 56     | 30                       | 3                  |
| 36       |    |                            | 58     | 5                        |                    |
| 33       | -1 |                            | 60     | 2                        | -1                 |
| 0 00003  |    |                            | 62     | 0 000020                 | 0                  |
| 33       | +1 |                            | 64     | 1                        | +1                 |
| 34       | 1  |                            | 66     | 3                        |                    |
| 38       |    |                            | 68     | 7                        | 3                  |
| 4        | 3  |                            | 70     | 33                       | 3                  |
| 0 0 0048 | +3 |                            | 72     | 0 000040                 | +4                 |
| 55       | 4  |                            | 74     | 48                       | 5                  |
| 64       | 5  |                            | 76     | 58                       | 5                  |
| 73       | 5  |                            | 78     | 68                       | 6                  |
| 8        | 5  |                            | 80     | 8                        | 6                  |
| 0 00093  | +5 |                            | 82     | 0 000091                 | +6                 |
| 1 3      | 5  |                            | 84     | 104                      | 6                  |
| 113      | 5  |                            | 86     | 116                      | 6                  |
| 123      | 5  |                            | 88     | 1 7                      | 6                  |
| 132      | 5  |                            | 90     | 138                      | 5                  |
| 0 000141 | +4 |                            | 92     | 0 000147                 | +5                 |
| 149      | 4  |                            | 94     | 157                      | 5                  |
| 155      | 3  |                            | 96     | 165                      | 4                  |
| 160      |    |                            | 98     | 171                      | 3                  |
| 000164   | +  |                            | 100    | 0 000175                 | +2                 |

Appl dC t t +

LV

| M   | E O S T                 | M   | E O S T  |
|-----|-------------------------|-----|----------|
| 00  | <sup>a</sup><br>0 00005 | 100 | 0 000017 |
| 02  | 45                      | 102 | 17       |
| 04  | 40                      | 104 | 16       |
| 06  | 35                      | 106 | 16       |
| 08  | 30                      | 108 | 17       |
| 10  | 6                       | 110 | 18       |
| 12  | 0 00 0 3                | 112 | 0 000021 |
| 14  | 0                       | 114 | 4        |
| 16  | 18                      | 116 | 8        |
| 18  | 17                      | 118 | 3        |
| 20  | 16                      | 120 | 37       |
| 22  | 0 000016                | 122 | 0 000042 |
| 24  | 17                      | 124 | 47       |
| 26  | 18                      | 126 | 53       |
| 28  | 0                       | 128 | 57       |
| 30  | 23                      | 130 | 62       |
| 32  | 0 000027                | 132 | 0 000067 |
| 34  | 31                      | 134 | 71       |
| 36  | 36                      | 136 | 75       |
| 38  | 41                      | 138 | 78       |
| 40  | 46                      | 140 | 81       |
| 42  | 0 000051                | 142 | 0 00 083 |
| 44  | 56                      | 144 | 85       |
| 46  | 61                      | 146 | 84       |
| 48  | 66                      | 148 | 84       |
| 50  | 70                      | 150 | 83       |
| 52  | 0 000074                | 152 | 0 000081 |
| 54  | 77                      | 154 | 78       |
| 56  | 80                      | 156 | 75       |
| 58  | 82                      | 158 | 71       |
| 60  | 84                      | 160 | 67       |
| 62  | 0 000085                | 162 | 0 000063 |
| 64  | 84                      | 164 | 58       |
| 66  | 83                      | 166 | 53       |
| 68  | 8                       | 168 | 48       |
| 70  | 79                      | 170 | 42       |
| 72  | 0 000076                | 172 | 0 000037 |
| 74  | 7                       | 174 | 33       |
| 76  | 68                      | 176 | 29       |
| 78  | 64                      | 178 | 24       |
| 80  | 59                      | 180 | 21       |
| 82  | 0 000054                | 182 | 0 000 18 |
| 84  | 49                      | 184 | 17       |
| 86  | 43                      | 186 | 17       |
| 88  | 38                      | 188 | 17       |
| 90  | 34                      | 190 | 16       |
| 92  | 0 000030                | 192 | 0 00016  |
| 94  | 5                       | 194 | 17       |
| 96  |                         | 196 | 18       |
| 98  | 19                      | 198 | 2        |
| 100 | 0 000017                | 200 | 0 0000 5 |

Appl dC ta t + oo

LVI

| E   | E O S T                  |
|-----|--------------------------|
| 00  | <sup>a</sup><br>0 000050 |
| 05  | 55                       |
| 10  | 6                        |
| 15  | 65                       |
| 20  | 69                       |
| 25  | 73                       |
| 30  | 0 000075                 |
| 35  | 77                       |
| 40  | 78                       |
| 45  | 78                       |
| 50  | 77                       |
| 55  | 0 000075                 |
| 60  | 72                       |
| 65  | 68                       |
| 70  | 64                       |
| 75  | 59                       |
| 80  | 0 000054                 |
| 85  | 48                       |
| 90  | 43                       |
| 95  | 38                       |
| 100 | 34                       |
| 105 | 0 000030                 |
| 110 | 26                       |
| 115 | 24                       |
| 120 | 23                       |
| 125 | 22                       |
| 130 | 0 00002                  |
| 135 | 4                        |
| 140 | 26                       |
| 145 | 9                        |
| 150 | 33                       |
| 155 | 0 000038                 |
| 160 | 43                       |
| 165 | 48                       |
| 170 | 53                       |
| 175 | 58                       |
| 180 | 0 000063                 |
| 185 | 68                       |
| 190 | 71                       |
| 195 | 74                       |
| 200 | 0 000077                 |

C t t + oo 5

LVII

| I    | Ecl Oc       |
|------|--------------|
|      | <sup>a</sup> |
| 1850 | 0 000 05     |
| 60   | 7            |
| 70   | 9            |
| 80   | 9            |
| 90   | 10           |
| 1900 | 10           |
| 1910 | 0 000011     |
| 20   | 14           |
| 30   | 17           |
| 40   |              |
| 50   | 29           |
| 1960 | 0 000037     |
| 70   | 46           |
| 80   | 54           |
| 90   | 6            |
| 2000 | 000068       |

C t t + oo

LVIII

| I    | Sh Tr        |
|------|--------------|
|      | <sup>a</sup> |
| 1850 | 0 000095     |
| 60   | 93           |
| 70   | 91           |
| 80   | 91           |
| 90   | 90           |
| 1900 | 90           |
| 1910 | 0 000089     |
| 20   | 86           |
| 30   | 83           |
| 40   | 78           |
| 50   | 71           |
| 1960 | 000063       |
| 70   | 54           |
| 80   | 46           |
| 90   | 38           |
| 2000 | 0 00003      |

C t t + oo



# SATELLITE IV

## Tables of the Phenomena

LIX

Equation of the Reduction

Occultations

| J<br>γ | 0 <sup>d.0</sup> | 0 <sup>d.5</sup> | 1 <sup>d.0</sup> | 1 <sup>d.5</sup> | 2 <sup>d.0</sup> | 2 <sup>d.5</sup> | 3 <sup>d.0</sup> | 3 <sup>d.5</sup> | 4 <sup>d.0</sup> | 4 <sup>d.5</sup> | 5 <sup>d.0</sup> | 5 <sup>d.5</sup> | 6 <sup>d.0</sup> | 6 <sup>d.5</sup> | 7 <sup>d.0</sup> | 7 <sup>d.5</sup> | 8 <sup>d.0</sup> | 8 <sup>d.5</sup> | 9 <sup>d.0</sup> |
|--------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 0      | + 17             | + 17             | + 16             | + 14             | + 12             | + 10             | + 8              | + 5              | + 1              | - 2              | - 5              | - 8              | - 11             | - 13             | - 15             | - 16             | - 17             | - 17             | - 17             |
| 10     | +109             | +107             | +101             | + 92             | + 79             | + 64             | + 46             | + 28             | + 8              | -13              | - 34             | - 51             | - 69             | - 84             | - 95             | -103             | -109             | -109             | -106             |
| 20     | +197             | +193             | +182             | +166             | +144             | +116             | + 84             | + 49             | +13              | -24              | - 60             | - 94             | -125             | -151             | -171             | -186             | -195             | -196             | -191             |
| 30     | +280             | +274             | +259             | +236             | +204             | +164             | +119             | + 70             | +19              | -34              | - 85             | -134             | -178             | -214             | -244             | -265             | -278             | -279             | -271             |
| 40     | +354             | +347             | +328             | +298             | +258             | +208             | +151             | + 88             | +23              | -44              | -108             | -169             | -225             | -271             | -308             | -335             | -351             | -352             | -342             |
| 50     | +418             | +409             | +388             | +352             | +305             | +245             | +178             | +104             | +28              | -51              | -127             | -200             | -265             | -321             | -365             | -397             | -415             | -416             | -410             |
| 60     | +470             | +460             | +435             | +395             | +343             | +275             | +199             | +116             | +31              | -57              | -144             | -224             | -298             | -360             | -409             | -445             | -466             | -468             | -454             |
| 70     | +507             | +497             | +470             | +427             | +370             | +298             | +216             | +126             | +33              | -63              | -155             | -243             | -322             | -388             | -443             | -483             | -503             | -505             | -490             |
| 80     | +530             | +519             | +492             | +446             | +387             | +311             | +226             | +132             | +35              | -65              | -163             | -253             | -336             | -406             | -463             | -502             | -526             | -528             | -513             |
| 90     | +537             | +526             | +498             | +452             | +392             | +316             | +229             | +134             | +35              | -66              | -164             | -257             | -341             | -412             | -469             | -509             | -533             | -535             | -520             |
| 100    | +528             | +517             | +490             | +445             | +386             | +311             | +225             | +131             | +34              | -65              | -161             | -252             | -336             | -404             | -461             | -502             | -524             | -526             | -511             |
| 110    | +504             | +494             | +467             | +425             | +368             | +295             | +215             | +125             | +33              | -62              | -155             | -241             | -319             | -387             | -440             | -477             | -500             | -502             | -487             |
| 120    | +464             | +455             | +431             | +392             | +339             | +273             | +198             | +116             | +30              | -57              | -142             | -222             | -295             | -357             | -405             | -440             | -461             | -462             | -449             |
| 130    | +412             | +403             | +382             | +347             | +301             | +242             | +176             | +103             | +27              | -50              | -126             | -197             | -262             | -316             | -360             | -390             | -409             | -410             | -399             |
| 140    | +347             | +340             | +322             | +292             | +252             | +203             | +148             | + 87             | +22              | -42              | -106             | -166             | -220             | -266             | -303             | -328             | -344             | -345             | -335             |
| 150    | +272             | +266             | +252             | +229             | +198             | +160             | +115             | + 68             | +17              | -33              | - 83             | -130             | -173             | -209             | -238             | -257             | -270             | -271             | -263             |
| 160    | +188             | +184             | +175             | +159             | +138             | +111             | + 80             | + 47             | +12              | -24              | - 57             | - 90             | -120             | -144             | -164             | -178             | -187             | -187             | -182             |
| 170    | + 98             | + 96             | + 92             | + 83             | + 72             | + 58             | + 42             | + 25             | + 6              | -13              | - 30             | - 47             | - 63             | - 76             | - 86             | - 94             | - 98             | - 98             | - 96             |
| 180    | + 9              | + 8              | + 8              | + 7              | + 7              | + 6              | + 4              | + 2              | + 0              | - 1              | - 3              | - 5              | - 6              | - 7              | - 8              | - 8              | - 9              | - 9              | - 8              |
| 190    | - 83             | - 82             | - 78             | - 71             | - 61             | - 48             | - 36             | - 20             | - 6              | +10              | + 26             | + 40             | + 53             | + 64             | + 73             | + 80             | + 83             | + 83             | + 82             |
| 200    | -173             | -169             | -160             | -146             | -126             | -101             | - 74             | - 43             | -12              | +21              | + 54             | + 83             | +110             | +132             | +151             | +164             | +172             | +173             | +168             |
| 210    | -258             | -253             | -239             | -217             | -189             | -151             | -110             | - 64             | -17              | +32              | + 80             | +123             | +164             | +198             | +226             | +245             | +256             | +257             | +250             |
| 220    | -335             | -328             | -310             | -283             | -244             | -197             | -143             | - 83             | -22              | +41              | +102             | +157             | +213             | +257             | +292             | +317             | +332             | +334             | +324             |
| 230    | -403             | -394             | -373             | -339             | -294             | -235             | -171             | -100             | -26              | +50              | +123             | +192             | +255             | +308             | +351             | +381             | +399             | +401             | +389             |
| 240    | -457             | -448             | -424             | -385             | -334             | -269             | -194             | -114             | -30              | +56              | +140             | +219             | +290             | +350             | +399             | +433             | +454             | +455             | +442             |
| 250    | -499             | -489             | -463             | -420             | -364             | -293             | -212             | -124             | -33              | +61              | +152             | +239             | +317             | +382             | +435             | +472             | +495             | +497             | +483             |
| 260    | -526             | -515             | -488             | -443             | -384             | -308             | -223             | -131             | -34              | +65              | +161             | +251             | +334             | +402             | +459             | +498             | +522             | +524             | +509             |
| 270    | -537             | -526             | -498             | -452             | -392             | -318             | -229             | -134             | -35              | +66              | +164             | +257             | +341             | +412             | +469             | +509             | +533             | +535             | +520             |
| 280    | -532             | -521             | -493             | -448             | -389             | -312             | -226             | -132             | -35              | +65              | +163             | +255             | +338             | +408             | +465             | +504             | +528             | +530             | +515             |
| 290    | -512             | -498             | -474             | -431             | -373             | -300             | -218             | -127             | -33              | +63              | +157             | +245             | +325             | +392             | +447             | +485             | +508             | +510             | +495             |
| 300    | -476             | -467             | -442             | -401             | -347             | -279             | -203             | -118             | -31              | +59              | +145             | +228             | +302             | +365             | +416             | +452             | +473             | +474             | +460             |
| 310    | -427             | -418             | -397             | -359             | -312             | -251             | -181             | -106             | -28              | +52              | +131             | +205             | +272             | +327             | +373             | +405             | +424             | +425             | +414             |
| 320    | -365             | -358             | -339             | -307             | -267             | -214             | -156             | - 91             | -23              | +45              | +112             | +174             | +231             | +280             | +318             | +346             | +362             | +363             | +353             |
| 330    | -292             | -286             | -271             | -246             | -213             | -171             | -125             | - 73             | -19              | +36              | + 89             | +140             | +185             | +224             | +256             | +277             | +290             | +291             | +282             |
| 340    | -211             | -206             | -195             | -177             | -153             | -123             | - 90             | - 52             | -13              | +27              | + 64             | +101             | +134             | +162             | +184             | +200             | +209             | +210             | +204             |
| 350    | -122             | -120             | -113             | -102             | - 89             | - 72             | - 51             | - 30             | - 8              | +15              | + 37             | + 58             | + 78             | + 94             | +107             | +115             | +121             | +121             | +118             |
| 360    | - 31             | - 31             | - 30             | - 27             | - 23             | - 19             | - 13             | - 7              | - 2              | + 4              | + 10             | + 15             | + 20             | + 25             | + 28             | + 30             | + 31             | + 31             | + 31             |
| 370    | + 61             | + 60             | + 56             | + 49             | + 44             | + 36             | + 26             | + 15             | + 4              | - 7              | - 19             | - 29             | - 39             | - 47             | - 53             | - 58             | - 61             | - 61             | - 59             |
| 380    | +151             | +148             | +140             | +127             | +109             | + 88             | + 64             | + 38             | +10              | -18              | - 46             | - 72             | - 96             | -116             | -131             | -143             | -150             | -150             | -146             |
| 390    | +237             | +232             | +220             | +200             | +173             | +138             | +101             | + 60             | +16              | -29              | - 73             | -113             | -150             | -182             | -207             | -227             | -235             | -236             | -229             |
| 400    | +316             | +310             | +293             | +267             | +230             | +185             | +134             | + 79             | +21              | -40              | - 96             | -150             | -200             | -243             | -276             | -300             | -314             | -315             | -306             |

No Constant has been applied.

The unit equals 0<sup>d.000000</sup>.

This equation applies for Occultations only.

# SATELLITE IV

## Tables of the Phenomena

LIX *continued*

Equation of the Reduction

Occultations

| $\gamma$ | $9^d 0$ | $9^d 5$ | $10^d 0$ | $10^d 5$ | $11^d 0$ | $11^d 5$ | $12^d 0$ | $12^d 5$ | $13^d 0$ | $13^d 5$ | $14^d 0$ | $14^d 5$ | $15^d 0$ | $15^d 5$ | $16^d 0$ | $16^d 5$ | $17^d 0$ | $17^d 5$ | $18^d 0$ |
|----------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 0        | - 17    | - 15    | - 14     | - 12     | - 9      | - 7      | - 4      | 0        | + 3      | + 6      | + 9      | + 11     | + 13     | + 15     | + 17     | + 17     | + 17     | + 16     | + 15     |
| 10       | -106    | - 99    | - 89     | - 75     | - 58     | - 41     | - 1      | - 1      | +19      | + 39     | + 58     | + 74     | + 88     | + 98     | +106     | +109     | +108     | +104     | + 96     |
| 20       | -191    | -179    | -160     | -135     | -106     | - 74     | - 38     | - 1      | +35      | + 71     | +105     | +133     | +158     | +177     | +190     | +196     | +195     | +187     | +174     |
| 30       | -271    | -253    | - 28     | -192     | -151     | - 15     | - 54     | - 2      | + 5      | +101     | +148     | +19      | +274     | +251     | + 71     | + 79     | +278     | +267     | + 46     |
| 40       | - 34    | - 3     | -287     | - 43     | -191     | - 13     | - 68     | - 3      | +64      | +17      | +187     | + 41     | +294     | +318     | + 34     | +35      | +350     | +337     | +31      |
| 50       | -410    | -378    | -340     | - 87     | - 25     | -156     | - 81     | - 3      | +75      | +150     | + 2      | + 83     | +336     | +376     | +404     | +416     | +413     | +398     | +368     |
| 60       | -454    | - 45    | -381     | -322     | -253     | -175     | - 91     | - 3      | +84      | +169     | +249     | +318     | +376     | +42      | +454     | +467     | +465     | +447     | +413     |
| 70       | -490    | -459    | -411     | -348     | -274     | -190     | - 99     | - 4      | +91      | +183     | +269     | +344     | +47      | +455     | +490     | +504     | +50      | +483     | +446     |
| 80       | -513    | -480    | -430     | -364     | - 86     | -198     | -103     | - 4      | +95      | +192     | + 81     | +359     | +46      | +477     | +512     | +57      | +55      | +504     | +467     |
| 90       | -50     | -486    | -436     | -369     | -290     | - 01     | -104     | - 4      | +97      | +194     | + 85     | +364     | +431     | +483     | +519     | +534     | +532     | +511     | +473     |
| 100      | -511    | -478    | -429     | -363     | -285     | -197     | - 1      | - 4      | +95      | +191     | + 81     | +358     | +44      | +475     | +510     | +525     | +522     | +50      | +465     |
| 110      | -487    | -456    | -409     | -347     | - 72     | -188     | - 97     | - 3      | +92      | +18      | +267     | +34      | +405     | +453     | +487     | +501     | +498     | +480     | +444     |
| 120      | -449    | - 41    | -378     | -318     | -250     | -173     | - 90     | - 3      | +84      | +166     | +246     | +315     | +373     | +417     | +448     | +461     | +460     | +443     | +409     |
| 130      | -399    | -373    | -334     | -282     | - 2      | -153     | - 80     | - 3      | +74      | +149     | + 18     | +280     | +331     | +370     | +398     | +409     | +408     | +392     | +363     |
| 140      | 335     | -313    | - 81     | -238     | -186     | - 13     | - 67     | -        | +6       | +124     | +184     | +235     | +278     | +312     | +335     | +345     | +343     | +330     | +305     |
| 150      | -263    | - 46    | - 21     | -186     | -146     | -101     | - 53     | -        | +49      | + 98     | +144     | +185     | +218     | +244     | +262     | + 71     | + 70     | + 59     | +240     |
| 160      | -182    | -171    | -153     | -129     | -10      | - 71     | - 36     | - 1      | +34      | + 67     | +100     | +18      | +151     | +169     | +182     | +187     | +187     | +180     | +165     |
| 170      | - 96    | - 90    | - 80     | - 68     | - 54     | - 37     | - 19     | 0        | +18      | + 36     | + 5      | + 67     | + 78     | + 89     | + 95     | + 98     | + 97     | + 94     | + 87     |
| 180      | - 8     | - 8     | - 7      | - 6      | - 5      | - 4      | - 1      |          | +1       | + 3      | + 5      | + 6      | + 7      | + 8      | + 8      | + 9      | + 9      | + 8      | + 8      |
| 190      | + 82    | + 76    | + 68     | + 57     | + 45     | + 31     | + 17     | + 1      | -15      | 30       | - 44     | - 57     | - 67     | - 75     | - 81     | - 83     | - 83     | - 80     | - 73     |
| 200      | +168    | +157    | +141     | +119     | + 93     | + 65     | + 34     | + 1      | -31      | - 6      | - 9      | -118     | -139     | 155      | -167     | -172     | -172     | -165     | -153     |
| 210      | +250    | +234    | +210     | +178     | +140     | + 97     | + 50     | +        | -46      | - 93     | -137     | -175     | - 07     | - 32     | - 49     | - 57     | - 56     | 246      | -228     |
| 220      | +34     | +33     | + 7      | +29      | +181     | +125     | + 65     | +        | -60      | -121     | -177     | - 28     | - 69     | -300     | - 34     | 333      | -332     | 319      | -295     |
| 230      | +389    | +36     | +327     | + 76     | +197     | +151     | + 78     | + 3      | -73      | -145     | -214     | -273     | - 32     | -361     | -389     | -400     | -399     | -383     | -354     |
| 240      | +44     | +414    | +371     | +314     | + 46     | +171     | + 88     | + 3      | -83      | -164     | -242     | -310     | -367     | -411     | -44      | -455     | -454     | -436     | -402     |
| 250      | +483    | +452    | +405     | +34      | + 69     | +184     | + 97     | + 3      | -90      | -180     | - 65     | -338     | -401     | -448     | -48      | -496     | -494     | -475     | -439     |
| 260      | +509    | +476    | +427     | +361     | +283     | +197     | +10      | + 4      | -95      | -190     | - 79     | -356     | -422     | -473     | -508     | -523     | -520     | -500     | -463     |
| 270      | +50     | +486    | +436     | +369     | + 9      | + 01     | +14      | + 4      | -97      | -194     | 85       | -364     | -431     | -483     | -519     | 534      | -532     | -511     | -473     |
| 280      | +515    | +482    | +432     | +366     | + 86     | +198     | +103     | + 4      | -96      | -192     | - 83     | -361     | -47      | -479     | -514     | -59      | -527     | -506     | -469     |
| 290      | +495    | +464    | +416     | +351     | + 76     | +191     | + 99     | + 4      | -9       | -185     | - 71     | -349     | -411     | -460     | -495     | -509     | -507     | -487     | -451     |
| 300      | +460    | +431    | +386     | +326     | +257     | +178     | + 93     | + 3      | -86      | -172     | - 53     | -323     | -383     | -428     | -460     | -473     | -471     | -454     | -420     |
| 310      | +414    | +387    | +347     | + 94     | +231     | +159     | + 83     | + 3      | -77      | -153     | -227     | - 90     | -343     | -384     | -413     | -45      | -43      | -407     | -377     |
| 320      | +353    | +330    | + 96     | + 50     | +197     | +136     | + 71     | +        | -66      | -132     | -194     | - 48     | - 93     | -328     | -353     | -363     | -361     | -348     | -321     |
| 330      | + 82    | + 64    | +237     | +200     | +158     | +109     | + 57     | +        | -53      | -106     | -155     | -199     | - 35     | - 63     | - 28     | -290     | -289     | -278     | -258     |
| 340      | + 04    | +190    | + 71     | +144     | +114     | + 79     | + 41     | + 1      | -39      | 76       | 11       | -143     | -169     | -189     | -204     | -209     | -209     | - 21     | -185     |
| 350      | +118    | +111    | + 99     | + 84     | + 66     | + 45     | + 3      | 0        | - 2      | - 44     | - 65     | - 83     | - 98     | -110     | -118     | -121     | -121     | -116     | -108     |
| 360      | + 31    | + 9     | + 5      | + 2      | + 17     | + 1      | + 6      | 0        | - 6      | - 1      | - 16     | - 1      | - 5      | - 28     | - 30     | - 31     | - 31     | - 30     | - 28     |
| 370      | - 59    | - 55    | - 50     | - 41     | - 33     | - 3      | - 12     | - 1      | +10      | +        | + 33     | + 4      | + 49     | + 56     | + 59     | + 61     | + 60     | + 58     | + 53     |
| 380      | -146    | -136    | - 1      | -103     | - 81     | - 54     | - 29     | - 1      | +27      | + 54     | + 80     | + 1      | +11      | +135     | +146     | +150     | +150     | +144     | +132     |
| 390      | - 29    | - 15    | -19      | -163     | - 18     | - 88     | - 47     | -        | +42      | + 85     | +16      | +161     | + 90     | + 13     | +229     | + 35     | +234     | + 26     | +209     |
| 400      | -306    | -286    | - 57     | -217     | -170     | -118     | - 61     | -        | +57      | +114     | +167     | + 14     | + 54     | + 84     | +305     | +314     | +313     | +301     | +278     |

N C t th b ppl d

Th t q l oooo

Phi q tl ppl f O ut ti ly

# SATELLITE IV

## Tables of the Phenomena

LXEquation of the ReductionTransits

| $\gamma$ | J   | 0 <sup>d.0</sup> 0 <sup>d.5</sup> 1 <sup>d.0</sup> |      |      | 1 <sup>d.5</sup> 2 <sup>d.0</sup> 2 <sup>d.5</sup> |      |      | 3 <sup>d.0</sup> 3 <sup>d.5</sup> 4 <sup>d.0</sup> |      |     | 4 <sup>d.5</sup> 5 <sup>d.0</sup> 5 <sup>d.5</sup> |      |      | 6 <sup>d.0</sup> 6 <sup>d.5</sup> 7 <sup>d.0</sup> |      |      | 7 <sup>d.5</sup> 8 <sup>d.0</sup> 8 <sup>d.5</sup> |      |      | 9 <sup>d.0</sup> |
|----------|-----|--|------|------|--|------|------|--|------|-----|--|------|------|--|------|------|--|------|------|------------------|
|          |     |  |      |      |  |      |      |  |      |     |  |      |      |  |      |      |  |      |      |                  |
|          | a   |  |      |      |  |      |      |  |      |     |  |      |      |  |      |      |  |      |      |                  |
|          | 0   | - 23   | - 23 | - 22 | - 20   | - 17 | - 13 | - 10   | - 6  | - 1 | + 3  | + 7  | + 11 | + 14   | + 17 | + 20 | + 22   | + 23 | + 23 | + 22             |
|          | 10  | -147   | -144 | -137 | -125   | -108 | - 87 | - 63   | - 36 | - 9 | +18  | + 45 | + 71 | + 93   | +114 | +129 | +140   | +146 | +146 | +143             |
|          | 20  | -266   | -261 | -247 | -224   | -194 | -157 | -113   | - 67 | -17 | +32  | + 81 | +128 | +169   | +204 | +232 | +252   | +264 | +265 | +257             |
|          | 30  | -379   | -371 | -351 | -319   | -276 | -221 | -161   | - 94 | -25 | +46  | +115 | +181 | +240   | +290 | +330 | +359   | +375 | +377 | +366             |
|          | 40  | -478   | -469 | -444 | -402   | -349 | -281 | -204   | -120 | -31 | +58  | +145 | +229 | +304   | +366 | +417 | +453   | +474 | +476 | +462             |
|          | 50  | -565   | -554 | -524 | -476   | -413 | -332 | -240   | -141 | -37 | +70  | +173 | +270 | +358   | +433 | +493 | +536   | +561 | +563 | +547             |
|          | 60  | -635   | -623 | -589 | -535   | -463 | -372 | -271   | -158 | -41 | +78  | +194 | +303 | +403   | +486 | +554 | +602   | +630 | +632 | +613             |
|          | 70  | -685   | -672 | -635 | -578   | -500 | -404 | -292   | -171 | -45 | +84  | +209 | +329 | +435   | +525 | +598 | +650   | +680 | +682 | +663             |
|          | 80  | -717   | -703 | -665 | -604   | -523 | -421 | -305   | -179 | -46 | +88  | +219 | +343 | +455   | +549 | +626 | +688   | +711 | +714 | +693             |
|          | 90  | -726   | -712 | -673 | -612   | -530 | -426 | -310   | -181 | -47 | +89  | +222 | +347 | +461   | +556 | +634 | +688   | +720 | +723 | +702             |
|          | 100 | -714   | -700 | -663 | -602   | -521 | -419 | -305   | -178 | -46 | +87  | +218 | +342 | +453   | +547 | +622 | +677   | +708 | +711 | +690             |
|          | 110 | -681   | -668 | -632 | -575   | -497 | -400 | -290   | -171 | -44 | +83  | +208 | +326 | +433   | +521 | +595 | +646   | +675 | +678 | +659             |
|          | 120 | -629   | -616 | -582 | -530   | -458 | -369 | -269   | -157 | -40 | +76  | +192 | +301 | +399   | +481 | +548 | +596   | +623 | +626 | +607             |
|          | 130 | -557   | -546 | -517 | -470   | -406 | -327 | -237   | -139 | -36 | +67  | +169 | +266 | +354   | +426 | +486 | +528   | +552 | +555 | +538             |
|          | 140 | -469   | -460 | -440 | -395   | -342 | -275 | -199   | -117 | -30 | +57  | +143 | +224 | +297   | +359 | +409 | +445   | +465 | +467 | +453             |
|          | 150 | -368   | -361 | -341 | -310   | -269 | -216 | -157   | - 92 | -23 | +46  | +112 | +176 | +234   | +282 | +320 | +348   | +365 | +367 | +356             |
|          | 160 | -254   | -249 | -236 | -215   | -186 | -149 | -108   | - 64 | -18 | +31  | + 77 | +121 | +161   | +195 | +222 | +242   | +252 | +253 | +246             |
|          | 170 | -134   | -131 | -124 | -112   | - 97 | - 78 | - 57   | - 34 | - 9 | +17  | + 40 | + 63 | + 85   | +103 | +117 | +126   | +133 | +133 | +130             |
|          | 180 | - 11   | - 11 | - 10 | - 9  | - 8  | - 7  | - 6  | - 3  | - 1 | + 1  | + 3  | + 5  | + 7  | + 9  | + 9  | + 10   | + 11 | + 11 | + 11             |
|          | 190 | +113   | +111 | +105 | + 94   | + 83 | + 66 | + 48   | + 28 | + 7 | -14  | - 35 | - 54 | - 72   | - 87 | - 99 | -107   | -112 | -113 | -110             |
|          | 200 | +234   | +230 | +217 | +198   | +171 | +138 | +100   | + 59 | +15 | -29  | - 72 | -112 | -149   | -180 | -204 | -222   | -232 | -234 | -227             |
|          | 210 | +349   | +342 | +323 | +295   | +255 | +205 | +149   | + 87 | +22 | -43  | -107 | -167 | -222   | -267 | -305 | -331   | -346 | -348 | -338             |
|          | 220 | +453   | +443 | +420 | +382   | +330 | +266 | +193   | +114 | +30 | -55  | -138 | -216 | -288   | -347 | -395 | -429   | -449 | -451 | -438             |
|          | 230 | +544   | +533 | +504 | +458   | +397 | +319 | +232   | +136 | +36 | -67  | -166 | -260 | -345   | -417 | -475 | -515   | -539 | -542 | -526             |
|          | 240 | +617   | +605 | +573 | +520   | +451 | +363 | +263   | +154 | +40 | -76  | -189 | -296 | -392   | -473 | -539 | -586   | -612 | -615 | -598             |
|          | 250 | +674   | +661 | +625 | +568   | +492 | +397 | +287   | +169 | +44 | -83  | -206 | -322 | -428   | -517 | -588 | -639   | -669 | -671 | -652             |
|          | 260 | +710   | +696 | +659 | +599   | +519 | +417 | +303   | +178 | +46 | -87  | -217 | -340 | -451   | -545 | -620 | -674   | -704 | -707 | -686             |
|          | 270 | +726   | +712 | +673 | +612   | +530 | +426 | +310   | +181 | +47 | -89  | -222 | -347 | -461   | -556 | -634 | -688   | -720 | -723 | -702             |
|          | 280 | +719   | +704 | +667 | +606   | +525 | +423 | +307   | +179 | +46 | -88  | -219 | -344 | -457   | -551 | -628 | -682   | -713 | -716 | -695             |
|          | 290 | +692   | +678 | +642 | +583   | +505 | +406 | +295   | +174 | +45 | -84  | -211 | -331 | -439   | -530 | -603 | -656   | -686 | -689 | -670             |
|          | 300 | +644   | +631 | +597 | +542   | +470 | +379 | +275   | +161 | +41 | -79  | -197 | -308 | -409   | -493 | -561 | -610   | -638 | -641 | -623             |
|          | 310 | +577   | +566 | +536 | +486   | +421 | +339 | +247   | +144 | +37 | -73  | -176 | -276 | -366   | -442 | -504 | -547   | -572 | -575 | -558             |
|          | 320 | +493   | +482 | +457 | +416   | +360 | +290 | +210   | +123 | +31 | -61  | -151 | -236 | -313   | -378 | -430 | -467   | -489 | -491 | -477             |
|          | 330 | +395   | +387 | +367 | +333   | +288 | +233 | +169   | + 99 | +25 | -49  | -120 | -189 | -251   | -302 | -344 | -375   | -391 | -393 | -382             |
|          | 340 | +285   | +279 | +264 | +240   | +208 | +167 | +121   | + 71 | +18 | -35  | - 86 | -136 | -181   | -218 | -248 | -270   | -282 | -284 | -276             |
|          | 350 | +166   | +162 | +154 | +139   | +120 | + 97 | + 70   | + 41 | +11 | -20  | - 50 | - 78 | -106   | -126 | -144 | -157   | -165 | -165 | -160             |
|          | 360 | + 43   | + 43 | + 41 | + 36   | + 31 | + 25 | + 18   | + 11 | + 3 | - 6  | - 13 | - 20 | - 28   | - 32 | - 38 | - 41   | - 43 | - 43 | - 41             |
|          | 370 | - 82   | - 80 | - 78 | - 70   | - 60 | - 48 | - 36   | - 20 | - 5 | +10  | + 25 | + 39 | + 52   | + 63 | + 72 | + 78   | + 81 | + 82 | + 79             |
|          | 380 | -204   | -200 | -189 | -172   | -149 | -120 | - 87   | - 51 | -13 | +25  | + 62 | + 98 | +130   | +156 | +177 | +193   | +202 | +202 | +197             |
|          | 390 | -320   | -314 | -297 | -270   | -234 | -188 | -135   | - 77 | -20 | +39  | + 97 | +153 | +203   | +245 | +279 | +303   | +317 | +319 | +310             |
|          | 400 | -427   | -418 | -396 | -360   | -312 | -252 | -183   | -107 | -28 | +52  | +130 | +204 | +272   | +327 | +373 | +405   | +424 | +425 | +413             |

No Constant has been applied.

The unit equals 0<sup>d.00000</sup>.

This Equation applies for Transits only.

# SATELLITE IV

## Tables of the Phenomena

LX continued

Equation of the Reduction

Transits

| J<br>γ | 9 <sup>d</sup> 0 | 9 <sup>d</sup> 5 | 10 <sup>d</sup> 0 | 10 <sup>d</sup> 5 | 11 <sup>d</sup> 0 | 11 <sup>d</sup> 5 | 12 <sup>d</sup> 0 | 12 <sup>d</sup> 5 | 13 <sup>d</sup> 0 | 13 <sup>d</sup> 5 | 14 <sup>d</sup> 0 | 14 <sup>d</sup> 5 | 15 <sup>d</sup> 0 | 15 <sup>d</sup> 5 | 16 <sup>d</sup> 0 | 16 <sup>d</sup> 5 | 17 <sup>d</sup> 0 | 17 <sup>d</sup> 5 | 18 <sup>d</sup> 0 |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
|--------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---|---|----|---|----|---|---|---|---|---|---|---|---|---|---|---|----|
| a<br>0 | +                | +                | 0                 | +                 | 19                | +                 | 16                | +                 | 12                | +                 | 9                 | +                 | 4                 | 0                 | -                 | 4                 | -                 | 8                 | -                 | 1 | - | 15 | - | 18 | - | 2 | - | 2 | - | 3 | - | 3 | - | 2 | - | 20 |
| 10     | +143             | +133             | +10               | +1                | +79               | +53               | +8                | +1                | -7                | -54               | -78               | -10               | -118              | -13               | -143              | -146              | -146              | -140              | -130              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 20     | +57              | +4               | +16               | +183              | +143              | +99               | +51               | +2                | -48               | -96               | -14               | -181              | -13               | -239              | -57               | -65               | -64               | -54               | -235              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 30     | +366             | +342             | +37               | +60               | +04               | +142              | +74               | +3                | -70               | -136              | -00               | -56               | -304              | -340              | -365              | -376              | -375              | -360              | -334              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 40     | +462             | +433             | +388              | +328              | +258              | +179              | +93               | +3                | -85               | -172              | -253              | -35               | -383              | 430               | -461              | -475              | -473              | -456              | -42               |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 50     | +547             | +51              | +459              | +389              | +305              | +211              | +11               | +4                | -10               | -204              | -300              | -383              | -453              | -508              | -546              | -56               | -560              | -538              | -498              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 60     | +613             | +574             | +516              | +437              | +342              | +37               | +123              | +4                | -114              | -28               | 337               | -433              | -509              | -571              | -613              | -632              | -69               | -604              | -559              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 70     | +663             | +619             | +557              | +471              | +37               | +256              | +133              | +4                | -123              | -47               | -364              | -464              | -550              | -616              | -66               | -682              | -679              | -652              | -605              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 80     | +693             | +639             | +583              | +49               | +386              | +268              | +139              | +5                | -19               | -58               | -380              | -486              | -575              | -646              | -692              | -714              | -710              | -682              | -63               |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 90     | +7               | +657             | +590              | +499              | +392              | +271              | +141              | +5                | -131              | -62               | -385              | -49               | -583              | -653              | -701              | 72                | -719              | -691              | -640              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 100    | +690             | +647             | +580              | +491              | +385              | +67               | +138              | +4                | -19               | -58               | -379              | -484              | -573              | -642              | -690              | -711              | -707              | -680              | -630              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 110    | +659             | +616             | +554              | +468              | +368              | +55               | +133              | +4                | -123              | -46               | -362              | -46               | -546              | -613              | -658              | -678              | -675              | -649              | -601              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 120    | +67              | +568             | +511              | +432              | +339              | +235              | +122              | +4                | -113              | -226              | -333              | -426              | -504              | -565              | -606              | -626              | -62               | -598              | -554              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 130    | +538             | +503             | +453              | +383              | +300              | +07               | +108              | +3                | -100              | -200              | -294              | -376              | -445              | -499              | -537              | -554              | -55               | -530              | -491              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 140    | +453             | +44              | +381              | +322              | +254              | +174              | +92               | +2                | -85               | -169              | -47               | -318              | 376               | -44               | 453               | -466              | -464              | -446              | -413              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 150    | +356             | +33              | +99               | +253              | +199              | +138              | +71               | +2                | -66               | -133              | -195              | -250              | -94               | -331              | -355              | -366              | -365              | 350               | -34               |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 160    | +46              | +230             | +07               | +175              | +136              | +95               | +50               | +1                | -45               | -92               | -135              | -17               | -204              | -29               | -246              | -253              | -252              | -243              | -224              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 170    | +130             | +1               | +108              | +91               | +72               | +5                | +26               | +1                | -24               | -49               | -71               | -91               | -108              | -11               | -129              | -133              | -133              | -128              | -118              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 180    | +11              | +10              | +9                | +8                | +6                | +4                | +2                | 0                 | -                 | -4                | -6                | -8                | 9                 | -10               | -11               | -11               | -11               | -11               | -10               |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 190    | -110             | -103             | -9                | -78               | -61               | -43               | -22               | -1                | +20               | +40               | +60               | +76               | +91               | +102              | +109              | +113              | +112              | +107              | +100              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 200    | -27              | -1               | -190              | -161              | -16               | -87               | -45               | -2                | +4                | +84               | +115              | +159              | +187              | +210              | +26               | +233              | +32               | +23               | +207              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 210    | -338             | -316             | -84               | -40               | -188              | -130              | -67               | -3                | +63               | +16               | +185              | +37               | +280              | +315              | +337              | +347              | +346              | +333              | +308              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 220    | -438             | -410             | -367              | -311              | -245              | -17               | -88               | -3                | +81               | +163              | +40               | +307              | +363              | +408              | +437              | +450              | +447              | +431              | +399              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 230    | -526             | -492             | -442              | -374              | -294              | -03               | -106              | -4                | +98               | +196              | +88               | +369              | +436              | +489              | +525              | +541              | +539              | +518              | +479              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 240    | -598             | -559             | -50               | -425              | -333              | -231              | -120              | -4                | +111              | +223              | +38               | +419              | +494              | +556              | +597              | +614              | +611              | +588              | +544              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 250    | -65              | -610             | -547              | -464              | -364              | -25               | -131              | -4                | +11               | +244              | +357              | +457              | +541              | +606              | +651              | +671              | +668              | +64               | +594              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 260    | -686             | -64              | -578              | -489              | -383              | -65               | -138              | -4                | +129              | +57               | +377              | +482              | +571              | +639              | +686              | +707              | +703              | +676              | +626              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 270    | -70              | -657             | -59               | -499              | -39               | -71               | -141              | -5                | +131              | +62               | +385              | +49               | +583              | +653              | +701              | +73               | +719              | +691              | +640              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 280    | -695             | -65              | -585              | -494              | -388              | -268              | -139              | -5                | +129              | +60               | +382              | +487              | +577              | +647              | +694              | +716              | +712              | +684              | +633              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 290    | -670             | -65              | -56               | -475              | -373              | -58               | -135              | -4                | +125              | +49               | +366              | +469              | +555              | +623              | +668              | +689              | +686              | +659              | +609              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 300    | -63              | -583             | -523              | -443              | -347              | -24               | -125              | -4                | +116              | +33               | +341              | +437              | +517              | +580              | +622              | +641              | +638              | +613              | +568              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 310    | -558             | -5               | -469              | -397              | -312              | -16               | -112              | -3                | +104              | +28               | +306              | +391              | +464              | +50               | +557              | +574              | +57               | +550              | +509              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 320    | -477             | -446             | -400              | -339              | -66               | -184              | -95               | -2                | +89               | +178              | +261              | +334              | +396              | +443              | +476              | +491              | +489              | +469              | +435              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 330    | -382             | -358             | -321              | -271              | -213              | -147              | -76               | -3                | +71               | +143              | +21               | +268              | +317              | +356              | +381              | +393              | +391              | +376              | +348              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 340    | -76              | -58              | -23               | -196              | -154              | -107              | -56               | -2                | +51               | +13               | +151              | +193              | +8                | +257              | +75               | +83               | +28               | +272              | +251              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 350    | -160             | -150             | -134              | -113              | -89               | -6                | -3                | -1                | +3                | +59               | +88               | +113              | +133              | +149              | +159              | +165              | +164              | +158              | +146              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 360    | -41              | -38              | -35               | -29               | -3                | -16               | -9                | -1                | +8                | +16               | +23               | +29               | +34               | +38               | +4                | +43               | +43               | +41               | +38               |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 370    | +79              | +74              | +67               | +57               | +44               | +31               | +16               | -                 | 15                | -3                | -43               | -55               | -66               | -73               | -79               | -81               | -81               | -79               | -72               |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 380    | +197             | +185             | +165              | +14               | +110              | +76               | +39               | +1                | -36               | -74               | -108              | -139              | 64                | -183              | -197              | -203              | -202              | -194              | -180              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 390    | +310             | +9               | +61               | +2                | +172              | +119              | +6                | +                 | -57               | -115              | -170              | -17               | -57               | -288              | -308              | -318              | -317              | -305              | -282              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |
| 400    | +413             | +386             | +347              | +294              | +30               | +160              | +83               | +3                | -77               | -154              | -6                | -289              | -343              | -384              | -41               | -425              | -423              | -406              | -377              |   |   |    |   |    |   |   |   |   |   |   |   |   |   |   |   |    |

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# SATELLITE IV

## Tables of the Phenomena

LXI

Corrections for Phase

Sh., Tr.

| 1  | 2        | 3                           | 4   | 5        |
|--|----------|-----------------------------|---|----------|
| Correcting<br>Factor<br>for Semi-<br>duration. | $\Delta$ | $p$                         | Correcting<br>Factor<br>for Reduc-<br>tion. | $\Delta$ |
| '00000   | 0        | <sup>d</sup><br><b>0'00</b> | '0000                                       | 0        |
| - 1  | - 1      | <b>0'01</b>                 | 0   | 0        |
| 3  | 3        | <b>0'02</b>                 | - 1   | 0        |
| 6  | 4        | <b>0'03</b>                 | 1   | - 1      |
| 11   | 6        | <b>0'04</b>                 | 2   | 2        |
| 17   | 7        | <b>0'05</b>                 | 4   | 2        |
| - '00025                                       | - 9      | <b>0'06</b>                 | - '0005                                     | - 2      |
| 34   | 10       | <b>0'07</b>                 | 7   | 2        |
| 45   | 12       | <b>0'08</b>                 | 9   | 2        |
| 57   | 13       | <b>0'09</b>                 | 11  | 3        |
| 70   | 14       | <b>0'10</b>                 | 14  | 3        |
| - '00085                                       | - 16     | <b>0'11</b>                 | - '0017                                     | - 3      |
| 101  | 17       | <b>0'12</b>                 | 20  | 4        |
| 119  | 19       | <b>0'13</b>                 | 24  | 4        |
| 138  | 20       | <b>0'14</b>                 | 28  | 4        |
| 158  | 21       | <b>0'15</b>                 | 32  | 4        |
| - '00180                                       | - 23     | <b>0'16</b>                 | - '0036                                     | - 5      |
| 203  | 24       | <b>0'17</b>                 | 41  | 5        |
| 228  | 26       | <b>0'18</b>                 | 46  | 5        |
| 254  | 27       | <b>0'19</b>                 | 51  | 6        |
| 281  | 28       | <b>0'20</b>                 | 57  | 6        |
| - '00310                                       | - 30     | <b>0'21</b>                 | - '0062                                     | - 6      |
| 341  | 32       | <b>0'22</b>                 | 68  | 7        |
| 373  | 33       | <b>0'23</b>                 | 75  | 7        |
| 406  | 34       | <b>0'24</b>                 | 82  | 7        |
| 440  | 35       | <b>0'25</b>                 | 88  | 7        |
| - '00476                                       | - 37     | <b>0'26</b>                 | - '0096                                     | - 8      |
| 513  | 38       | <b>0'27</b>                 | 103   | 8        |
| 552  | 40       | <b>0'28</b>                 | 111   | 8        |
| 592  | 41       | <b>0'29</b>                 | 119   | 9        |
| - '00633                                       | - 42     | <b>0'30</b>                 | - '0128                                     | - 9      |

| 1  | 2        | 3                           | 4   | 5        |
|--|----------|-----------------------------|---|----------|
| Correcting<br>Factor<br>for Semi-<br>duration. | $\Delta$ | $p$                         | Correct-<br>ing Factor<br>for Reduc-<br>tion. | $\Delta$ |
| - '00633                                       | - 42     | <sup>d</sup><br><b>0'30</b> | - '0128                                       | - 9      |
| 676  | 44       | <b>0'31</b>                 | 136   | 9        |
| 721  | 46       | <b>0'32</b>                 | 145   | 10       |
| 767  | 47       | <b>0'33</b>                 | 155   | 10       |
| 814  | 48       | <b>0'34</b>                 | 165   | 10       |
| 862  | 49       | <b>0'35</b>                 | 174   | 10       |
| - '00911                                       | - 50     | <b>0'36</b>                 | - '0185                                       | - 10     |
| 962  | 52       | <b>0'37</b>                 | 195   | 11       |
| 1015   | 54       | <b>0'38</b>                 | 206   | 11       |
| 1069   | 55       | <b>0'39</b>                 | 217   | 12       |
| 1125   | 57       | <b>0'40</b>                 | 229   | 12       |
| - '01182                                       | - 58     | <b>0'41</b>                 | - '0240                                       | - 12     |
| 1240   | 59       | <b>0'42</b>                 | 252   | 13       |
| 1300   | 61       | <b>0'43</b>                 | 265   | 13       |
| 1361   | 62       | <b>0'44</b>                 | 277   | 13       |
| 1423   | 63       | <b>0'45</b>                 | 290   | 13       |
| - '01487                                       | - 65     | <b>0'46</b>                 | - '0303                                       | - 14     |
| 1552   | 66       | <b>0'47</b>                 | 317   | 14       |
| 1618   | 67       | <b>0'48</b>                 | 331   | 14       |
| 1686   | 69       | <b>0'49</b>                 | 345   | 15       |
| 1755   | 71       | <b>0'50</b>                 | 360   | 15       |
| - '01827                                       | - 72     | <b>0'51</b>                 | - '0375                                       | - 15     |
| 1899   | 73       | <b>0'52</b>                 | 390   | 16       |
| 1972   | 74       | <b>0'53</b>                 | 406   | 16       |
| 2046   | 75       | <b>0'54</b>                 | 422   | 16       |
| 2122   | 77       | <b>0'55</b>                 | 438   | 16       |
| - '02200                                       | - 79     | <b>0'56</b>                 | - '0454                                       | - 17     |
| 2280   | 80       | <b>0'57</b>                 | 471   | 17       |
| 2360   | 81       | <b>0'58</b>                 | 488   | 18       |
| 2442   | 82       | <b>0'59</b>                 | 506   | 18       |
| - '02524                                       | - 82     | <b>0'60</b>                 | - '0524                                       | - 18     |

The Argument is the Annual Parallax,  $p$ , as computed from the Approximate Tables IV, V, VI.  
Columns 1, 4 give factors which must be multiplied respectively into the Semiduration as taken from Tables XLII-LI, and the Reduction as taken from Tables LII-LX, and the products taken as further corrections of these quantities.  
When  $p$  is positive, these corrections apply to *Ingress* for the Shadow and *Egress* for the Transit of Disc; when  $p$  is negative, they apply to *Egress* for the Shadow and *Ingress* for the Transit of Disc.

# SATELLITE IV

## Tables of the Phenomena

LXII

Light Curves in Eclipse

| L t<br>(h) <sub>0</sub> | 1 50 | 2 00 | 2 10 | 2 20 | 2 30 | 2 40 | 2 45 | 2 46 | 2 47 | 2 48 | 2 49 | L t<br>(h) <sub>0</sub> |
|-------------------------|------|------|------|------|------|------|------|------|------|------|------|-------------------------|
|                         |      | 1 00 | 0 90 | 0 80 | 0 70 | 0 60 | 0 55 | 0 54 | 0 53 | 0 52 | 0 51 |                         |
| -20                     | 0 01 | 0 1  | 0 01 | 0 01 | 0 01 | 0 00 | 00   | 0 00 | 0 00 | 0 00 | 0 00 | -20                     |
| 18                      | 02   | 0    | 0    | 00   | 0 02 | 0 01 | 0 00 | 0 00 | 0 0  | 0 00 | 0 00 | 18                      |
| 16                      | 0 4  | 0 04 | 0 04 | 4    | 0 04 | 0 03 | 0 01 | 0 0  | 0 0  | 0 00 | 0 00 | 16                      |
| 14                      | 0 07 | 0 07 | 0 7  | 0 7  | 0 07 | 0 6  | 0 03 | 0 03 | 0 02 | 0 01 | 0 00 | 14                      |
| 12                      | 1    | 0 1  | 0 1  | 0 1  | 0 1  | 0 10 | 0 08 | 0 07 | 0 06 | 0 03 | 0 1  | 12                      |
| -10                     | 0 17 | 0 17 | 0 17 | 0 17 | 0 17 | 0 16 | 0 14 | 0 13 | 0 1  | 0 1  | 0 4  | -10                     |
| 08                      | 0 5  | 5    | 0 5  | 0 25 | 5    | 4    | 0 33 | 0 3  | 0 31 | 0 30 | 0 25 | 08                      |
| 06                      | 0 35 | 0 35 | 35   | 0 35 | 35   | 0 34 | 45   | 0 45 | 0 44 | 0 43 | 0 41 | 06                      |
| 04                      | 0 46 | 0 46 | 46   | 0 46 | 0 46 | 0 46 | 0 6  | 0 60 | 0 60 | 0 59 | 0 59 | 04                      |
| -02                     | 0 6  | 0 60 | 60   | 0 60 | 0 60 | 0 60 | 0 75 | 0 75 | 0 75 | 0 75 | 0 75 | -02                     |
| 00                      | 0 75 | 75   | 0 75 | 0 75 | 0 75 | 0 75 | 0 94 | 0 94 | 0 94 | 0 94 | 0 93 | 00                      |
| +02                     | 0 94 | 94   | 0 94 | 94   | 0 94 | 0 94 | 1 14 | 1 13 | 1 1  | 1 10 | 1 06 | +02                     |
| 04                      | 1 16 | 1 16 | 1 16 | 1 16 | 1 16 | 1 16 | 1 35 | 1 34 | 1 3  | 1 26 | 1 15 | 04                      |
| 06                      | 1 4  | 1 4  | 1 40 | 1 4  | 1 40 | 1 38 | 1 58 | 1 56 | 1 51 | 1 42 | 1 17 | 06                      |
| 08                      | 1 72 | 1 70 | 1 70 | 1 70 | 1 68 | 1 64 | 1 86 | 1 80 | 1 72 | 1 55 | 1 17 | 08                      |
| +10                     | 07   | 03   | 03   | 3    | 00   | 1 95 | 1 3  | 03   | 1 90 | 1 66 | 1 10 | +10                     |
| 12                      | 48   | 2 42 | 40   | 2 38 | 36   | 2 29 | 39   | 6    | 2 07 | 1 74 | 0 98 | 12                      |
| 14                      | 97   | 86   | 2 84 | 2 8  | 80   | 2 68 | 2 68 | 50   | 2 25 | 1 79 | 0 83 | 14                      |
| 16                      | 3 60 | 3 45 | 3 43 | 3 40 | 3 3  | 3 11 | 99   | 2 72 | 2 35 | 1 78 | 0 67 | 16                      |
| 18                      | 4 31 | 4 1  | 4 08 | 4 05 | 3 91 | 3 60 | 3 31 | 2 9  | 2 4  | 1 74 | 0 48 | 18                      |
| +20                     | 5 45 | 4 95 | 4 88 | 4 77 | 4 60 | 4 12 |      |      |      |      |      | +20                     |

l i t l l g l f  
y l t l l t l f  
f m g i t l f t l  
s t l l t l l i  
p d l t l  
l d i t (k) (k)  
i p l t l l t l  
t l i i t l  
l t l l i (k)  
t l f t l  
l t l l f t l  
S l l w i l l i  
t f l y t l l f  
J p l t f  
t h t f t l  
S t l l t d i

LXIII

Mean Motion in Light Curve

| Lat  | $\Delta(l)_{\text{peri}}$ | 3  | Lat  | Lat  | $\Delta(l)_{\text{peri}}$ | Lat  | Lat  | $\Delta(l)_{\text{peri}}$ | Lat  |
|------|---------------------------|----|------|------|---------------------------|------|------|---------------------------|------|
| 0 50 | 0000                      |    | 2 50 | 0 70 | 0280                      | 2 30 | 1 10 | 00441                     | 1 90 |
| 51   | 64                        | 46 | 2 49 | 72   | 292                       | 2 28 | 1 12 | 445                       | 1 88 |
| 52   | 91                        | 24 | 2 48 | 74   | 304                       | 2 26 | 1 14 | 449                       | 1 86 |
| 53   | 111                       | 19 | 2 47 | 76   | 315                       | 2 24 | 1 16 | 453                       | 1 84 |
| 54   | 1 9                       | 16 | 2 46 | 78   | 3 6                       | 2 22 | 1 18 | 457                       | 1 82 |
| 55   | 143                       | 14 | 2 45 | 80   | 336                       | 2 20 | 1 20 | 460                       | 1 80 |
| 0 56 | 00156                     | 13 | 2 44 | 0 82 | 00345                     | 2 18 | 1 22 | 00463                     | 1 78 |
| 57   | 168                       | 12 | 2 43 | 84   | 354                       | 2 16 | 1 24 | 466                       | 1 76 |
| 58   | 180                       | 11 | 2 42 | 86   | 363                       | 2 14 | 1 26 | 469                       | 1 74 |
| 59   | 190                       | 1  | 2 41 | 88   | 37                        | 2 12 | 1 28 | 47                        | 1 72 |
| 60   | 200                       | 10 | 2 40 | 90   | 380                       | 2 10 | 1 30 | 474                       | 1 70 |
| 0 61 | 00210                     | 10 | 2 39 | 0 92 | 00388                     | 2 08 | 1 32 | 00476                     | 1 68 |
| 62   | 219                       | 9  | 2 38 | 94   | 395                       | 2 06 | 1 34 | 478                       | 1 66 |
| 63   | 228                       | 9  | 2 37 | 96   | 40                        | 2 04 | 1 36 | 480                       | 1 64 |
| 64   | 236                       | 8  | 2 36 | 98   | 408                       | 2 02 | 1 38 | 481                       | 1 62 |
| 65   | 244                       | 8  | 2 35 | 1 00 | 414                       | 2 00 | 1 40 | 48                        | 1 60 |
| 0 66 | 00 5                      | 8  | 2 34 | 1 02 | 0042                      | 1 98 | 1 42 | 00483                     | 1 58 |
| 67   | 259                       | 7  | 2 33 | 1 04 | 4 5                       | 1 96 | 1 44 | 484                       | 1 56 |
| 68   | 266                       | 7  | 2 32 | 1 06 | 43                        | 1 94 | 1 46 | 485                       | 1 54 |
| 69   | 273                       | 7  | 2 31 | 1 08 | 435                       | 1 92 | 1 48 | 485                       | 1 52 |
| 0 70 | 00280                     | 7  | 2 30 | 1 10 | 0 441                     | 1 90 | 1 50 | 00486                     | 1 50 |

Th T bl t l t f h g f th C d te (k) with th tim It m t b t d by th  
Eq t l f T bl LXIV d th th ig t t h d i + f di pp f pp

LXIV

Equation of Motion

| Var  | - 02 - 01 | 00 | + 01 + 02 | V r  |
|------|-----------|----|-----------|------|
| Lat  |           |    |           | Lat  |
| 1 50 | + 5 + 2   | 0  | - 2 - 5   | 1 50 |
| 2 00 | 6 3       | 0  | 3 6       | 1 00 |
| 2 10 | 6 3       | 0  | 3 6       | 0 90 |
| 2 20 | 7 3       | 0  | 3 7       | 0 80 |
| 2 30 | 8 4       | 0  | 4 8       | 0 70 |
| 2 40 | 11 5      | 0  | 5 11      | 0 60 |
| 2 45 | + 15 + 7  | 0  | - 7 - 15  | 0 55 |
| 2 46 | 17 8      | 0  | 8 17      | 0 54 |
| 2 47 | 19 10     | 0  | 10 19     | 0 53 |
| 2 48 | 4 1       | 0  | 12 24     | 0 52 |
| 2 49 | + 34 + 17 | 0  | - 17 - 34 | 0 51 |

Tl D l t l f t l l T l l t b t k r r t l t  
t l t f T bl LXII Tl l t q l 0000



AUXILIARY TABLES  
of  
Jupiter's Orbit,  
The Equation of Light,  
and  
Conversions to the Decimal System



# AUXILIARY TABLES

C

Node of Jupiter's Orbit

| Year | Ascending Node | $\Delta$<br>10 <sup>y</sup> |
|------|----------------|-----------------------------|
| 1850 | 98 56.1        | 6.1                         |
| 60   | 99 2.2         | 6.1                         |
| 70   | 8.3            | 6.1                         |
| 80   | 14.4           | 6.2                         |
| 90   | 20.6           | 6.2                         |
| 1900 | 26.7           | 6.1                         |
| 10   | 32.8           | 6.1                         |
| 20   | 38.9           | 6.2                         |
| 30   | 45.1           | 6.2                         |
| 40   | 51.2           | 6.1                         |
| 50   | 99 57.3        | 6.1                         |
| 60   | 100 3.4        | 6.2                         |
| 70   | 9.6            | 6.2                         |
| 80   | 15.7           | 6.1                         |
| 90   | 21.8           | 6.1                         |
| 2000 | 100 27.9       | 6.1                         |

This Table shows the longitude of the ascending Node of Jupiter's Orbit upon the mean ecliptic of date.

CI

Reduction from Ecliptic to Jupiter's Orbit

| Ecliptic Longitude—Node |    |     |     | Reduction<br>1900 | $\Delta$<br>10' | Variation<br>per 100 <sup>y</sup> | Ecliptic Longitude—Node |     |     |     |
|-------------------------|----|-----|-----|-------------------|-----------------|-----------------------------------|-------------------------|-----|-----|-----|
| °                       | °  | °   | °   | "                 |                 |                                   | °                       | °   | °   | °   |
| 0                       | 90 | 180 | 270 | 0.0               | .16             | 0.0                               | 90                      | 180 | 270 | 360 |
| 2                       | 88 | 182 | 268 | + 1.9 -           | .16             | 0.0                               | 92                      | 178 | 272 | 358 |
| 4                       | 86 | 184 | 266 | 3.8               | .16             | 0.0                               | 94                      | 176 | 274 | 356 |
| 6                       | 84 | 186 | 264 | 5.6               | .15             | - 0.1 +                           | 96                      | 174 | 276 | 354 |
| 8                       | 82 | 188 | 262 | 7.4               | .15             | 0.1                               | 98                      | 172 | 278 | 352 |
| 10                      | 80 | 190 | 260 | 9.2               | .15             | 0.1                               | 100                     | 170 | 280 | 350 |
| 12                      | 78 | 192 | 258 | 11.0              | .14             | 0.1                               | 102                     | 168 | 282 | 348 |
| 14                      | 76 | 194 | 256 | 12.6              | .14             | 0.1                               | 104                     | 166 | 284 | 346 |
| 16                      | 74 | 196 | 254 | 14.3              | .13             | 0.1                               | 106                     | 164 | 286 | 344 |
| 18                      | 72 | 198 | 252 | 15.8              | .13             | 0.1                               | 108                     | 162 | 288 | 342 |
| 20                      | 70 | 200 | 250 | 17.3              | .12             | 0.2                               | 110                     | 160 | 290 | 340 |
| 22                      | 68 | 202 | 248 | 18.7              | .11             | 0.2                               | 112                     | 158 | 292 | 338 |
| 24                      | 66 | 204 | 246 | 20.0              | .11             | 0.2                               | 114                     | 156 | 294 | 336 |
| 26                      | 64 | 206 | 244 | 21.2              | .10             | 0.2                               | 116                     | 154 | 296 | 334 |
| 28                      | 62 | 208 | 242 | 22.3              | .09             | 0.2                               | 118                     | 152 | 298 | 332 |
| 30                      | 60 | 210 | 240 | 23.3              | .08             | 0.2                               | 120                     | 150 | 300 | 330 |
| 32                      | 58 | 212 | 238 | 24.2              | .07             | 0.2                               | 122                     | 148 | 302 | 328 |
| 34                      | 56 | 214 | 236 | 25.0              | .06             | 0.2                               | 124                     | 146 | 304 | 326 |
| 36                      | 54 | 216 | 234 | 25.6              | .05             | 0.2                               | 126                     | 144 | 306 | 324 |
| 38                      | 52 | 218 | 232 | 26.1              | .04             | 0.2                               | 128                     | 142 | 308 | 322 |
| 40                      | 50 | 220 | 230 | 26.5              | .03             | 0.2                               | 130                     | 140 | 310 | 320 |
| 42                      | 48 | 222 | 228 | 26.8              | .02             | 0.2                               | 132                     | 138 | 312 | 318 |
| 44                      | 46 | 224 | 226 | + 26.9 -          | .01             | - 0.2 +                           | 134                     | 136 | 314 | 316 |

This Equation to be applied to Ecliptic Longitude of Jupiter to give Orbit Longitude.  
The Argument is the *Ecliptic Longitude* minus *Longitude of Node* from Table C.  
The sign follows the side on which the Argument is found.

Reduction of Annual Parallax to Jupiter's Orbit

CII

| $\beta$           | Factor | $\Delta$<br>rd | $\beta$             | Factor | $\Delta$<br>rd |
|-------------------|--------|----------------|---------------------|--------|----------------|
| <sup>d</sup><br>0 | + .235 | 0.0            | <sup>d</sup><br>200 | - .163 | 0.0            |
| 10                | .230   | - 0.9          | 210                 | .161   | + 0.3          |
| 20                | .217   | 1.8            | 220                 | .157   | 0.6            |
| 30                | .193   | 2.7            | 230                 | .150   | 0.8            |
| 40                | .164   | 3.1            | 240                 | .141   | 1.0            |
| 50                | .131   | 3.5            | 250                 | .130   | 1.3            |
| 60                | .094   | 3.6            | 260                 | .116   | 1.5            |
| 70                | .059   | 3.5            | 270                 | .100   | 1.7            |
| 80                | + .024 | 3.4            | 280                 | .082   | 2.1            |
| 90                | - .008 | 3.2            | 290                 | .059   | 2.5            |
| 100               | .037   | 2.7            | 300                 | .033   | 2.8            |
| 110               | .062   | 2.3            | 310                 | - .004 | 3.1            |
| 120               | .083   | 2.0            | 320                 | + .028 | 3.3            |
| 130               | .102   | 1.8            | 330                 | .062   | 3.6            |
| 140               | .118   | 1.5            | 340                 | .099   | 3.6            |
| 150               | .131   | 1.2            | 350                 | .134   | 3.4            |
| 160               | .142   | 1.0            | 360                 | .167   | 3.1            |
| 170               | .151   | 0.8            | 370                 | .195   | 2.6            |
| 180               | .158   | 0.6            | 380                 | .218   | 1.8            |
| 190               | .162   | - 0.3          | 390                 | .231   | + 0.9          |
| 200               | - .163 | 0.0            | 400                 | + .235 | 0.0            |

CIII

| p                 | Correction | p                   | Correction |
|-------------------|------------|---------------------|------------|
| <sup>c</sup><br>0 | "<br>0.0   | <sup>c</sup><br>± 6 | "<br>± 5.6 |
| ± 1               | ± 0.9      | 7                   | 6.5        |
| 2                 | 1.8        | 8                   | 7.4        |
| 3                 | 2.8        | 9                   | 8.4        |
| 4                 | 3.7        | 10                  | 9.3        |
| 5                 | 4.6        | 11                  | 10.3       |
| ± 6               | ± 5.6      | ± 12                | ± 11.3     |

Tables CII, CIII apply when the Annual Parallax has been computed from the *ecliptic longitudes* of Jupiter and the Sun, and supply corrections for reducing it to Jupiter's Orbit.

Table CII: take out the factor with Argument  $\beta$ , multiply it into the sum of the two equations taken out from Table CI with the arguments respectively:—*Sun's Longitude* minus *Jupiter's Ascending Node*, *Jupiter's Longitude* minus *Ascending Node*, and add the product to the computed Annual Parallax.

Table CIII: take out the correction with argument  $p$ , the Annual Parallax, and apply it to the computed value of  $p$ .

# AUXILIARY TABLES

CIV

The Equation of Light

| Log Dist | Equat on | 3<br>Δ | Log Dist | Equation | 3<br>Δ | Log Dist | Equat on | 3<br>Δ | Log Dist | Equat on | 3<br>Δ | Log Dist                            | Equation | 3<br>Δ |
|----------|----------|--------|----------|----------|--------|----------|----------|--------|----------|----------|--------|-------------------------------------|----------|--------|
| 585      | 0 2193   | + 51   | 635      | 0 0 49 1 | + 58   | 685      | 0 27939  | + 64   | 735      | 0 031348 | + 72   | 785                                 | 0 035173 | + 81   |
| 6        | 244      | 51     | 6        | 958      | 58     | 6        | 028003   | 65     | 6        | 4        | 73     | 6                                   | 54       | 81     |
| 7        | 95       | 5      | 7        | 025 16   | 58     | 7        | 068      | 65     | 7        | 493      | 73     | 7                                   | 335      | 82     |
| 8        | 347      | 5      | 8        | 073      | 58     | 8        | 133      | 65     | 8        | 565      | 73     | 8                                   | 417      | 82     |
| 9        | 398      | 5      | 9        | 131      | 58     | 9        | 197      | 65     | 9        | 638      | 73     | 9                                   | 498      | 82     |
| 590      | 45       | 5      | 640      | 189      | 58     | 690      | 26       | 66     | 740      | 711      | 73     | 790                                 | 580      | 82     |
| 591      | 0 5 1    | + 5    | 641      | 025 47   | + 58   | 691      | 83 8     | + 66   | 741      | 031784   | + 73   | 791                                 | 03566    | + 83   |
| 2        | 553      | 5      | 2        | 305      | 59     | 2        | 393      | 65     | 2        | 857      | 74     | 2                                   | 745      | 83     |
| 3        | 605      | 52     | 3        | 364      | 59     | 3        | 458      | 66     | 3        | 931      | 74     | 3                                   | 827      | 83     |
| 4        | 657      | 53     | 4        | 422      | 59     | 4        | 5 4      | 66     | 4        | 03 004   | 74     | 4                                   | 910      | 83     |
| 5        | 710      | 53     | 5        | 481      | 59     | 5        | 590      | 66     | 5        | 078      | 74     | 5                                   | 992      | 83     |
| 596      | 02276    | + 52   | 646      | 025539   | + 59   | 696      | 028656   | + 66   | 746      | 03 15    | + 74   | 796                                 | 036075   | + 83   |
| 7        | 814      | 53     | 7        | 598      | 59     | 7        | 72       | 66     | 7        | 6        | 75     | 7                                   | 158      | 84     |
| 8        | 867      | 53     | 8        | 657      | 59     | 8        | 788      | 66     | 8        | 301      | 75     | 8                                   | 242      | 84     |
| 9        | 92       | 53     | 9        | 716      | 60     | 9        | 854      | 67     | 9        | 315      | 75     | 9                                   | 3 5      | 84     |
| 600      | 973      | 53     | 650      | 776      | 60     | 700      | 9 1      | 67     | 750      | 450      | 75     | 800                                 | 409      | 84     |
| 601      | 3026     | + 53   | 651      | 0 5835   | + 60   | 701      | 0 8987   | + 67   | 751      | 03 5 1   | + 75   | 801                                 | 036493   | + 84   |
| 2        | 0 9      | 53     | 2        | 895      | 60     | 2        | 029054   | 67     | 2        | 599      | 76     | 2                                   | 577      | 84     |
| 3        | 13       | 53     | 3        | 954      | 6      | 3        | 1 1      | 67     | 3        | 675      | 76     | 3                                   | 661      | 85     |
| 4        | 185      | 54     | 4        | 0 6014   | 60     | 4        | 188      | 68     | 4        | 750      | 75     | 4                                   | 746      | 85     |
| 5        | 39       | 54     | 5        | 74       | 60     | 5        | 256      | 68     | 5        | 8 5      | 76     | 5                                   | 831      | 85     |
| 606      | 023 9    | + 54   | 656      | 026134   | + 60   | 706      | 0 93 3   | + 68   | 756      | 032901   | + 76   | 806                                 | 036916   | + 85   |
| 7        | 346      | 54     | 7        | 194      | 61     | 7        | 39       | 68     | 7        | 977      | 76     | 7                                   | 037001   | 85     |
| 8        | 400      | 54     | 8        | 55       | 61     | 8        | 458      | 68     | 8        | 033053   | 76     | 8                                   | 086      | 85     |
| 9        | 454      | 54     | 9        | 315      | 61     | 9        | 5 6      | 68     | 9        | 1 9      | 76     | 9                                   | 171      | 86     |
| 610      | 5 8      | 54     | 660      | 376      | 61     | 710      | 594      | 69     | 760      | 05       | 77     | 810                                 | 257      | 86     |
| 611      | 0 3562   | + 54   | 661      | 026437   | + 61   | 711      | 0 9663   | + 69   | 761      | 033 8    | + 77   | 811                                 | 037343   | + 86   |
| 2        | 616      | 55     | 2        | 498      | 61     | 2        | 731      | 69     | 2        | 359      | 77     | 2                                   | 429      | 86     |
| 3        | 671      | 55     | 3        | 559      | 61     | 3        | 800      | 69     | 3        | 436      | 77     | 3                                   | 515      | 87     |
| 4        | 7 5      | 55     | 4        | 620      | 61     | 4        | 868      | 69     | 4        | 513      | 77     | 4                                   | 602      | 87     |
| 5        | 78       | 55     | 5        | 681      | 6      | 5        | 937      | 69     | 5        | 590      | 77     | 5                                   | 689      | 87     |
| 616      | 023835   | + 55   | 666      | 0 6743   | + 6    | 716      | 030006   | + 69   | 766      | 033667   | + 78   | 816                                 | 037775   | + 87   |
| 7        | 890      | 55     | 7        | 805      | 62     | 7        | 075      | 70     | 7        | 745      | 78     | 7                                   | 863      | 88     |
| 8        | 945      | 55     | 8        | 866      | 6      | 8        | 145      | 70     | 8        | 823      | 78     | 8                                   | 950      | 87     |
| 9        | 0 40 0   | 55     | 9        | 9 8      | 6      | 9        | 214      | 70     | 9        | 901      | 78     | 9                                   | 038037   | 88     |
| 620      | 055      | 56     | 670      | 990      | 63     | 720      | 84       | 70     | 770      | 179      | 78     | 820                                 | 0381 5   | + 88   |
| 621      | 0 4111   | + 56   | 671      | 0 7 53   | + 63   | 721      | 30354    | + 7    | 771      | 034057   | + 79   | CV<br>Correction of<br>the Equation |          |        |
| 2        | 166      | 56     | 2        | 115      | 63     | 2        | 4 4      | 7      | 2        | 136      | 79     |                                     |          |        |
| 3        | 2        | 56     | 3        | 178      | 63     | 3        | 494      | 70     | 3        | 214      | 79     |                                     |          |        |
| 4        | 78       | 56     | 4        | 4        | 63     | 4        | 564      | 70     | 4        | 293      | 79     |                                     |          |        |
| 5        | 334      | 56     | 5        | 303      | 63     | 5        | 634      | 71     | 5        | 37       | 8      |                                     |          |        |
| 626      | 024390   | + 56   | 676      | 027366   | + 63   | 726      | 030705   | + 71   | 776      | 03445    | + 80   | CV<br>Correction of<br>the Equation |          |        |
| 7        | 446      | 56     | 7        | 4 9      | 63     | 7        | 776      | 71     | 7        | 531      | 80     |                                     |          |        |
| 8        | 502      | 57     | 8        | 492      | 64     | 8        | 847      | 71     | 8        | 611      | 80     |                                     |          |        |
| 9        | 559      | 57     | 9        | 556      | 64     | 9        | 918      | 71     | 9        | 690      | 80     |                                     |          |        |
| 630      | 616      | 57     | 680      | 619      | 64     | 730      | 989      | 72     | 780      | 770      | 8      |                                     |          |        |
| 631      | 02467    | + 57   | 681      | 0 7683   | + 64   | 731      | 031061   | + 72   | 781      | 034851   | + 81   | CV<br>Correction of<br>the Equation |          |        |
| 2        | 7 9      | 57     | 2        | 747      | 64     | 2        | 13       | 72     | 2        | 931      | 80     |                                     |          |        |
| 3        | 786      | 57     | 3        | 810      | 64     | 3        | 04       | 7      | 3        | 035011   | 81     |                                     |          |        |
| 4        | 843      | 58     | 4        | 875      | 65     | 4        | 76       | 72     | 4        | 092      | 81     |                                     |          |        |
| 635      | 024901   | + 58   | 685      | 027939   | + 64   | 735      | 031348   | + 7    | 785      | 035173   | + 81   |                                     |          |        |

# AUXILIARY TABLES

CVI

Minutes and Seconds of Arc in Decimals of a Degree

| I  | 2      | I   | 2       |
|----|--------|-----|---------|
| /  | 0      | /   | 0       |
| 1  | '01667 | 51  | '85000  |
| 2  | '03333 | 52  | '86667  |
| 3  | '05000 | 53  | '88333  |
| 4  | '06667 | 54  | '90000  |
| 5  | '08333 | 55  | '91667  |
| 6  | '10000 | 56  | '93333  |
| 7  | '11667 | 57  | '95000  |
| 8  | '13333 | 58  | '96667  |
| 9  | '15000 | 59  | '98333  |
| 10 | '16667 | 60  | 1'00000 |
| 11 | '18333 | 61  | 1'01667 |
| 12 | '20000 | 62  | 1'03333 |
| 13 | '21667 | 63  | 1'05000 |
| 14 | '23333 | 64  | 1'06667 |
| 15 | '25000 | 65  | 1'08333 |
| 16 | '26667 | 66  | 1'10000 |
| 17 | '28333 | 67  | 1'11667 |
| 18 | '30000 | 68  | 1'13333 |
| 19 | '31667 | 69  | 1'15000 |
| 20 | '33333 | 70  | 1'16667 |
| 21 | '35000 | 71  | 1'18333 |
| 22 | '36667 | 72  | 1'20000 |
| 23 | '38333 | 73  | 1'21667 |
| 24 | '40000 | 74  | 1'23333 |
| 25 | '41667 | 75  | 1'25000 |
| 26 | '43333 | 76  | 1'26667 |
| 27 | '45000 | 77  | 1'28333 |
| 28 | '46667 | 78  | 1'30000 |
| 29 | '48333 | 79  | 1'31667 |
| 30 | '50000 | 80  | 1'33333 |
| 31 | '51667 | 81  | 1'35000 |
| 32 | '53333 | 82  | 1'36667 |
| 33 | '55000 | 83  | 1'38333 |
| 34 | '56667 | 84  | 1'40000 |
| 35 | '58333 | 85  | 1'41667 |
| 36 | '60000 | 86  | 1'43333 |
| 37 | '61667 | 87  | 1'45000 |
| 38 | '63333 | 88  | 1'46667 |
| 39 | '65000 | 89  | 1'48333 |
| 40 | '66667 | 90  | 1'50000 |
| 41 | '68333 | 91  | 1'51667 |
| 42 | '70000 | 92  | 1'53333 |
| 43 | '71667 | 93  | 1'55000 |
| 44 | '73333 | 94  | 1'56667 |
| 45 | '75000 | 95  | 1'58333 |
| 46 | '76667 | 96  | 1'60000 |
| 47 | '78333 | 97  | 1'61667 |
| 48 | '80000 | 98  | 1'63333 |
| 49 | '81667 | 99  | 1'65000 |
| 50 | '83333 | 100 | 1'66667 |

| I  | 2      | I   | 2      |
|----|--------|-----|--------|
| // | 0      | //  | 0      |
| 1  | '00028 | 51  | '01417 |
| 2  | 56     | 52  | 1444   |
| 3  | 83     | 53  | 1472   |
| 4  | 111    | 54  | 1500   |
| 5  | 139    | 55  | 1528   |
| 6  | '00167 | 56  | '01556 |
| 7  | 194    | 57  | 1583   |
| 8  | 222    | 58  | 1611   |
| 9  | 250    | 59  | 1639   |
| 10 | 278    | 60  | 1667   |
| 11 | '00306 | 61  | '01694 |
| 12 | 333    | 62  | 1722   |
| 13 | 361    | 63  | 1750   |
| 14 | 389    | 64  | 1778   |
| 15 | 417    | 65  | 1806   |
| 16 | '00444 | 66  | '01833 |
| 17 | 472    | 67  | 1861   |
| 18 | 500    | 68  | 1889   |
| 19 | 528    | 69  | 1917   |
| 20 | 556    | 70  | 1944   |
| 21 | '00583 | 71  | '01972 |
| 22 | 611    | 72  | 2000   |
| 23 | 639    | 73  | 2028   |
| 24 | 667    | 74  | 2056   |
| 25 | 694    | 75  | 2083   |
| 26 | '00722 | 76  | '02111 |
| 27 | 750    | 77  | 2139   |
| 28 | 778    | 78  | 2167   |
| 29 | 806    | 79  | 2194   |
| 30 | 833    | 80  | 2222   |
| 31 | '00861 | 81  | '02250 |
| 32 | 889    | 82  | 2278   |
| 33 | 917    | 83  | 2306   |
| 34 | 944    | 84  | 2333   |
| 35 | 972    | 85  | 2361   |
| 36 | '01000 | 86  | '02389 |
| 37 | 1028   | 87  | 2417   |
| 38 | 1056   | 88  | 2444   |
| 39 | 1083   | 89  | 2472   |
| 40 | 1111   | 90  | 2500   |
| 41 | '01139 | 91  | '02528 |
| 42 | 1167   | 92  | 2556   |
| 43 | 1194   | 93  | 2583   |
| 44 | 1222   | 94  | 2611   |
| 45 | 1250   | 95  | 2639   |
| 46 | '01278 | 96  | '02667 |
| 47 | 1306   | 97  | 2694   |
| 48 | 1333   | 98  | 2722   |
| 49 | 1361   | 99  | 2750   |
| 50 | '01389 | 100 | '02778 |

# AUXILIARY TABLES

CVII

Decimals of a Degree in Minutes and Seconds of Arc

|           |       |             |       |
|-----------|-------|-------------|-------|
|           |       |             |       |
| <b>01</b> | 0 36  | <b>51</b>   | 30 36 |
| <b>02</b> | 1 1   | <b>52</b>   | 31 1  |
| <b>03</b> | 1 48  | <b>53</b>   | 31 48 |
| <b>04</b> | 2 24  | <b>54</b>   | 32 4  |
| <b>05</b> | 3     | <b>55</b>   | 33    |
| <b>06</b> | 3 36  | <b>56</b>   | 33 36 |
| <b>07</b> | 4 1   | <b>57</b>   | 34 12 |
| <b>08</b> | 4 48  | <b>58</b>   | 34 48 |
| <b>09</b> | 5 24  | <b>59</b>   | 35 4  |
| <b>10</b> | 6 0   | <b>60</b>   | 36 0  |
| <b>11</b> | 6 36  | <b>61</b>   | 36 36 |
| <b>12</b> | 7 1   | <b>62</b>   | 37 12 |
| <b>13</b> | 7 48  | <b>63</b>   | 37 48 |
| <b>14</b> | 8 4   | <b>64</b>   | 38 4  |
| <b>15</b> | 9 0   | <b>65</b>   | 39    |
| <b>16</b> | 9 36  | <b>66</b>   | 39 36 |
| <b>17</b> | 10 1  | <b>67</b>   | 40 12 |
| <b>18</b> | 10 48 | <b>68</b>   | 40 48 |
| <b>19</b> | 11 4  | <b>69</b>   | 41 24 |
| <b>20</b> | 12 0  | <b>70</b>   | 42 0  |
| <b>21</b> | 12 36 | <b>71</b>   | 42 36 |
| <b>22</b> | 13 1  | <b>72</b>   | 43 12 |
| <b>23</b> | 13 48 | <b>73</b>   | 43 48 |
| <b>24</b> | 14 4  | <b>74</b>   | 44 4  |
| <b>25</b> | 15 0  | <b>75</b>   | 45 0  |
| <b>26</b> | 15 36 | <b>76</b>   | 45 36 |
| <b>27</b> | 16 1  | <b>77</b>   | 46 1  |
| <b>28</b> | 16 48 | <b>78</b>   | 46 48 |
| <b>29</b> | 17 4  | <b>79</b>   | 47 24 |
| <b>30</b> | 18 0  | <b>80</b>   | 48 0  |
| <b>31</b> | 18 36 | <b>81</b>   | 48 36 |
| <b>32</b> | 19 1  | <b>82</b>   | 49 1  |
| <b>33</b> | 19 48 | <b>83</b>   | 49 48 |
| <b>34</b> | 0 4   | <b>84</b>   | 50 4  |
| <b>35</b> | 1 0   | <b>85</b>   | 51    |
| <b>36</b> | 1 36  | <b>86</b>   | 51 36 |
| <b>37</b> | 2 1   | <b>87</b>   | 52 1  |
| <b>38</b> | 2 48  | <b>88</b>   | 52 48 |
| <b>39</b> | 3 4   | <b>89</b>   | 53 4  |
| <b>40</b> | 24 0  | <b>90</b>   | 54 0  |
| <b>41</b> | 4 36  | <b>91</b>   | 54 36 |
| <b>42</b> | 5 1   | <b>92</b>   | 55 1  |
| <b>43</b> | 5 48  | <b>93</b>   | 55 48 |
| <b>44</b> | 6 4   | <b>94</b>   | 56 4  |
| <b>45</b> | 7 0   | <b>95</b>   | 57 0  |
| <b>46</b> | 27 36 | <b>96</b>   | 57 36 |
| <b>47</b> | 28 1  | <b>97</b>   | 58 12 |
| <b>48</b> | 8 48  | <b>98</b>   | 58 48 |
| <b>49</b> | 29 4  | <b>99</b>   | 59 4  |
| <b>50</b> | 3 0   | <b>1 00</b> | 60 0  |

|             |       |             |       |
|-------------|-------|-------------|-------|
|             |       |             |       |
| <b>0001</b> | 0 36  | <b>0051</b> | 18 36 |
| <b>2</b>    | 0 7   | <b>52</b>   | 18 7  |
| <b>3</b>    | 1 08  | <b>53</b>   | 19 08 |
| <b>4</b>    | 1 44  | <b>54</b>   | 19 44 |
| <b>5</b>    | 1 8   | <b>55</b>   | 19 80 |
| <b>0006</b> | 16    | <b>0056</b> | 20 16 |
| <b>7</b>    | 2 5   | <b>57</b>   | 20 5  |
| <b>8</b>    | 88    | <b>58</b>   | 20 88 |
| <b>9</b>    | 3 4   | <b>59</b>   | 1 4   |
| <b>10</b>   | 3 6   | <b>60</b>   | 21 60 |
| <b>0011</b> | 3 96  | <b>0061</b> | 21 96 |
| <b>12</b>   | 4 3   | <b>62</b>   | 32    |
| <b>13</b>   | 4 68  | <b>63</b>   | 22 68 |
| <b>14</b>   | 5 04  | <b>64</b>   | 23 04 |
| <b>15</b>   | 5 40  | <b>65</b>   | 23 40 |
| <b>0016</b> | 5 76  | <b>0066</b> | 23 76 |
| <b>17</b>   | 6 1   | <b>67</b>   | 24 12 |
| <b>18</b>   | 6 48  | <b>68</b>   | 4 48  |
| <b>19</b>   | 6 84  | <b>69</b>   | 24 84 |
| <b>20</b>   | 7 20  | <b>70</b>   | 25 20 |
| <b>0021</b> | 7 56  | <b>0071</b> | 25 56 |
| <b>22</b>   | 7 9   | <b>72</b>   | 25 92 |
| <b>23</b>   | 8 28  | <b>73</b>   | 26 8  |
| <b>24</b>   | 8 64  | <b>74</b>   | 26 64 |
| <b>25</b>   | 9 00  | <b>75</b>   | 7 00  |
| <b>0026</b> | 9 36  | <b>0076</b> | 27 36 |
| <b>27</b>   | 9 72  | <b>77</b>   | 7 7   |
| <b>28</b>   | 10 08 | <b>78</b>   | 28 08 |
| <b>29</b>   | 1 44  | <b>79</b>   | 28 44 |
| <b>30</b>   | 10 80 | <b>80</b>   | 8 80  |
| <b>0031</b> | 11 16 | <b>0081</b> | 29 16 |
| <b>32</b>   | 11 52 | <b>82</b>   | 29 52 |
| <b>33</b>   | 11 88 | <b>83</b>   | 29 88 |
| <b>34</b>   | 12 4  | <b>84</b>   | 30 24 |
| <b>35</b>   | 12 60 | <b>85</b>   | 30 60 |
| <b>0036</b> | 1 96  | <b>0086</b> | 30 96 |
| <b>37</b>   | 13 32 | <b>87</b>   | 31 32 |
| <b>38</b>   | 13 68 | <b>88</b>   | 31 68 |
| <b>39</b>   | 14 04 | <b>89</b>   | 3 04  |
| <b>40</b>   | 14 40 | <b>90</b>   | 3 40  |
| <b>0041</b> | 14 76 | <b>0091</b> | 32 76 |
| <b>42</b>   | 15 12 | <b>92</b>   | 33 12 |
| <b>43</b>   | 15 48 | <b>93</b>   | 33 48 |
| <b>44</b>   | 15 84 | <b>94</b>   | 33 84 |
| <b>45</b>   | 16 20 | <b>95</b>   | 34    |
| <b>0046</b> | 16 56 | <b>0096</b> | 34 56 |
| <b>47</b>   | 16 92 | <b>97</b>   | 34 92 |
| <b>48</b>   | 17 8  | <b>98</b>   | 35 8  |
| <b>49</b>   | 17 64 | <b>99</b>   | 35 64 |
| <b>0050</b> | 18 0  | <b>0100</b> | 36 00 |

# AUXILIARY TABLES

CVIII

Decimals of a Day in Hours, Minutes and Seconds.

| 1    |  | 2          |    | 1     |      | 2          |    | 1    |       | 2          |  | 1    |       | 2          |  | 1    |       | 2      |  |
|------|--|------------|----|-------|------|------------|----|------|-------|------------|--|------|-------|------------|--|------|-------|--------|--|
| Days |  | H., M., S. |    | Days  |      | H., M., S. |    | Days |       | Min., Sec. |  | Days |       | Min., Sec. |  | Days |       | Sec.   |  |
| d    |  | h          | m  | s     | d    |            | h  | m    | s     | d          |  | m    | s     | d          |  | m    | s     | d      |  |
| 0'01 |  | 0          | 14 | 24'00 | 0'51 |            | 12 | 14   | 24'00 | 0001       |  | 0    | 8'64  | 0051       |  | 7    | 20'64 | 000001 |  |
| 0'02 |  | 0          | 28 | 48'00 | 0'52 |            | 12 | 28   | 48'00 | 2          |  | 0    | 17'28 | 52         |  | 7    | 29'28 | 2      |  |
| 0'03 |  | 0          | 43 | 12'00 | 0'53 |            | 12 | 43   | 12'00 | 3          |  | 0    | 25'92 | 53         |  | 7    | 37'92 | 3      |  |
| 0'04 |  | 0          | 57 | 36'00 | 0'54 |            | 12 | 57   | 36'00 | 4          |  | 0    | 34'56 | 54         |  | 7    | 46'56 | 4      |  |
| 0'05 |  | 1          | 12 | 0'00  | 0'55 |            | 13 | 12   | 0'00  | 5          |  | 0    | 43'20 | 55         |  | 7    | 55'20 | 5      |  |
| 0'06 |  | 1          | 26 | 24'00 | 0'56 |            | 13 | 26   | 24'00 | 0006       |  | 0    | 51'84 | 0056       |  | 8    | 3'84  | 000006 |  |
| 0'07 |  | 1          | 40 | 48'00 | 0'57 |            | 13 | 40   | 48'00 | 7          |  | 1    | 0'48  | 57         |  | 8    | 12'48 | 7      |  |
| 0'08 |  | 1          | 55 | 12'00 | 0'58 |            | 13 | 55   | 12'00 | 8          |  | 1    | 9'12  | 58         |  | 8    | 21'12 | 8      |  |
| 0'09 |  | 2          | 9  | 36'00 | 0'59 |            | 14 | 9    | 36'00 | 9          |  | 1    | 17'76 | 59         |  | 8    | 29'76 | 9      |  |
| 0'10 |  | 2          | 24 | 0'00  | 0'60 |            | 14 | 24   | 0'00  | 10         |  | 1    | 26'40 | 60         |  | 8    | 38'40 | 10     |  |
| 0'11 |  | 2          | 38 | 24'00 | 0'61 |            | 14 | 38   | 24'00 | 0011       |  | 1    | 35'04 | 0061       |  | 8    | 47'04 | 000011 |  |
| 0'12 |  | 2          | 52 | 48'00 | 0'62 |            | 14 | 52   | 48'00 | 12         |  | 1    | 43'68 | 62         |  | 8    | 55'68 | 12     |  |
| 0'13 |  | 3          | 7  | 12'00 | 0'63 |            | 15 | 7    | 12'00 | 13         |  | 1    | 52'32 | 63         |  | 9    | 4'32  | 13     |  |
| 0'14 |  | 3          | 21 | 36'00 | 0'64 |            | 15 | 21   | 36'00 | 14         |  | 2    | 0'96  | 64         |  | 9    | 12'96 | 14     |  |
| 0'15 |  | 3          | 36 | 0'00  | 0'65 |            | 15 | 36   | 0'00  | 15         |  | 2    | 9'60  | 65         |  | 9    | 21'60 | 15     |  |
| 0'16 |  | 3          | 50 | 24'00 | 0'66 |            | 15 | 50   | 24'00 | 0016       |  | 2    | 18'24 | 0066       |  | 9    | 30'24 | 000016 |  |
| 0'17 |  | 4          | 4  | 48'00 | 0'67 |            | 16 | 4    | 48'00 | 17         |  | 2    | 26'88 | 67         |  | 9    | 38'88 | 17     |  |
| 0'18 |  | 4          | 19 | 12'00 | 0'68 |            | 16 | 19   | 12'00 | 18         |  | 2    | 35'52 | 68         |  | 9    | 47'52 | 18     |  |
| 0'19 |  | 4          | 33 | 36'00 | 0'69 |            | 16 | 33   | 36'00 | 19         |  | 2    | 44'16 | 69         |  | 9    | 56'16 | 19     |  |
| 0'20 |  | 4          | 48 | 0'00  | 0'70 |            | 16 | 48   | 0'00  | 20         |  | 2    | 52'80 | 70         |  | 10   | 4'80  | 20     |  |
| 0'21 |  | 5          | 2  | 24'00 | 0'71 |            | 17 | 2    | 24'00 | 0021       |  | 3    | 1'44  | 0071       |  | 10   | 13'44 | 000021 |  |
| 0'22 |  | 5          | 16 | 48'00 | 0'72 |            | 17 | 16   | 48'00 | 22         |  | 3    | 10'08 | 72         |  | 10   | 22'08 | 22     |  |
| 0'23 |  | 5          | 31 | 12'00 | 0'73 |            | 17 | 31   | 12'00 | 23         |  | 3    | 18'72 | 73         |  | 10   | 30'72 | 23     |  |
| 0'24 |  | 5          | 45 | 36'00 | 0'74 |            | 17 | 45   | 36'00 | 24         |  | 3    | 27'36 | 74         |  | 10   | 39'36 | 24     |  |
| 0'25 |  | 6          | 0  | 0'00  | 0'75 |            | 18 | 0    | 0'00  | 25         |  | 3    | 36'00 | 75         |  | 10   | 48'00 | 25     |  |
| 0'26 |  | 6          | 14 | 24'00 | 0'76 |            | 18 | 14   | 24'00 | 0026       |  | 3    | 44'64 | 0076       |  | 10   | 56'64 | 000026 |  |
| 0'27 |  | 6          | 28 | 48'00 | 0'77 |            | 18 | 28   | 48'00 | 27         |  | 3    | 53'28 | 77         |  | 11   | 5'28  | 27     |  |
| 0'28 |  | 6          | 43 | 12'00 | 0'78 |            | 18 | 43   | 12'00 | 28         |  | 4    | 1'92  | 78         |  | 11   | 13'92 | 28     |  |
| 0'29 |  | 6          | 57 | 36'00 | 0'79 |            | 18 | 57   | 36'00 | 29         |  | 4    | 10'56 | 79         |  | 11   | 22'56 | 29     |  |
| 0'30 |  | 7          | 12 | 0'00  | 0'80 |            | 19 | 12   | 0'00  | 30         |  | 4    | 19'20 | 80         |  | 11   | 31'20 | 30     |  |
| 0'31 |  | 7          | 26 | 24'00 | 0'81 |            | 19 | 26   | 24'00 | 0031       |  | 4    | 27'84 | 0081       |  | 11   | 39'84 | 000031 |  |
| 0'32 |  | 7          | 40 | 48'00 | 0'82 |            | 19 | 40   | 48'00 | 32         |  | 4    | 36'48 | 82         |  | 11   | 48'48 | 32     |  |
| 0'33 |  | 7          | 55 | 12'00 | 0'83 |            | 19 | 55   | 12'00 | 33         |  | 4    | 45'12 | 83         |  | 11   | 57'12 | 33     |  |
| 0'34 |  | 8          | 9  | 36'00 | 0'84 |            | 20 | 9    | 36'00 | 34         |  | 4    | 53'76 | 84         |  | 12   | 5'76  | 34     |  |
| 0'35 |  | 8          | 24 | 0'00  | 0'85 |            | 20 | 24   | 0'00  | 35         |  | 5    | 2'40  | 85         |  | 12   | 14'40 | 35     |  |
| 0'36 |  | 8          | 38 | 24'00 | 0'86 |            | 20 | 38   | 24'00 | 0036       |  | 5    | 11'04 | 0086       |  | 12   | 23'04 | 000036 |  |
| 0'37 |  | 8          | 52 | 48'00 | 0'87 |            | 20 | 52   | 48'00 | 37         |  | 5    | 19'68 | 87         |  | 12   | 31'68 | 37     |  |
| 0'38 |  | 9          | 7  | 12'00 | 0'88 |            | 21 | 7    | 12'00 | 38         |  | 5    | 28'32 | 88         |  | 12   | 40'32 | 38     |  |
| 0'39 |  | 9          | 21 | 36'00 | 0'89 |            | 21 | 21   | 36'00 | 39         |  | 5    | 36'96 | 89         |  | 12   | 48'96 | 39     |  |
| 0'40 |  | 9          | 36 | 0'00  | 0'90 |            | 21 | 36   | 0'00  | 40         |  | 5    | 45'60 | 90         |  | 12   | 57'60 | 40     |  |
| 0'41 |  | 9          | 50 | 24'00 | 0'91 |            | 21 | 50   | 24'00 | 0041       |  | 5    | 54'24 | 0091       |  | 13   | 6'24  | 000041 |  |
| 0'42 |  | 10         | 4  | 48'00 | 0'92 |            | 22 | 4    | 48'00 | 42         |  | 6    | 2'88  | 92         |  | 13   | 14'88 | 42     |  |
| 0'43 |  | 10         | 19 | 12'00 | 0'93 |            | 22 | 19   | 12'00 | 43         |  | 6    | 11'52 | 93         |  | 13   | 23'52 | 43     |  |
| 0'44 |  | 10         | 33 | 36'00 | 0'94 |            | 22 | 33   | 36'00 | 44         |  | 6    | 20'16 | 94         |  | 13   | 32'16 | 44     |  |
| 0'45 |  | 10         | 48 | 0'00  | 0'95 |            | 22 | 48   | 0'00  | 45         |  | 6    | 28'80 | 95         |  | 13   | 40'80 | 45     |  |
| 0'46 |  | 11         | 2  | 24'00 | 0'96 |            | 23 | 2    | 24'00 | 0046       |  | 6    | 37'44 | 0096       |  | 13   | 49'44 | 000046 |  |
| 0'47 |  | 11         | 16 | 48'00 | 0'97 |            | 23 | 16   | 48'00 | 47         |  | 6    | 46'08 | 97         |  | 13   | 58'08 | 47     |  |
| 0'48 |  | 11         | 31 | 12'00 | 0'98 |            | 23 | 31   | 12'00 | 48         |  | 6    | 54'72 | 98         |  | 14   | 6'72  | 48     |  |
| 0'49 |  | 11         | 45 | 36'00 | 0'99 |            | 23 | 45   | 36'00 | 49         |  | 7    | 3'36  | 99         |  | 14   | 15'36 | 49     |  |
| 0'50 |  | 12         | 0  | 0'00  | 1'00 |            | 24 | 0    | 0'00  | 0050       |  | 7    | 12'00 | 0100       |  | 14   | 24'00 | 000050 |  |

# AUXILIARY TABLES

CIX

Hours, Minutes and Seconds in Decimals of a Day

| Hours | Days     | Hou s | Days     | Min | Days   | M n | D ys               | S c | Day                 | Sec | Days   |
|-------|----------|-------|----------|-----|--------|-----|--------------------|-----|---------------------|-----|--------|
| 0     | 00 000   | 50    | 083333   | 0   | 0 0 00 | 50  | <sup>d</sup> 34722 | 0   | <sup>d</sup> 0 00 0 | 50  | 000579 |
| 1     | 41667    | 51    | 1 5 0    | 1   | 694    | 51  | 35417              | 1   | 12                  | 51  | 590    |
| 2     | 083333   | 52    | 166667   | 2   | 1389   | 52  | 36111              | 2   | 23                  | 52  | 60     |
| 3     | 1250     | 53    | 8333     | 3   | 83     | 53  | 36806              | 3   | 35                  | 53  | 613    |
| 4     | 166667   | 54    | 25 00    | 4   | 778    | 54  | 37500              | 4   | 46                  | 54  | 625    |
| 5     | 08333    | 55    | 91667    | 5   | 347    | 55  | 38194              | 5   | 58                  | 55  | 637    |
| 6     | 50000    | 56    | 333333   | 6   | 004167 | 56  | 38889              | 6   | 000069              | 56  | 000648 |
| 7     | 9 667    | 57    | 37500    | 7   | 4861   | 57  | 39583              | 7   | 81                  | 57  | 660    |
| 8     | 333333   | 58    | 416667   | 8   | 5556   | 58  | 40 78              | 8   | 93                  | 58  | 671    |
| 9     | 375000   | 59    | 458333   | 9   | 6 50   | 59  | 4097               | 9   | 104                 | 59  | 683    |
| 10    | 4 6667   | 60    | 2 5 00 0 | 10  | 6944   | 60  | 41667              | 10  | 116                 | 60  | 694    |
| 11    | 458333   | 61    | 541667   | 11  | 007639 | 61  | 04 361             | 11  | 0001 7              | 61  | 000706 |
| 12    | 5 0000   | 62    | 2 583333 | 12  | 8333   | 62  | 43056              | 12  | 139                 | 62  | 718    |
| 13    | 541667   | 63    | 625 00   | 13  | 90 8   | 63  | 43750              | 13  | 150                 | 63  | 729    |
| 14    | 583333   | 64    | 666667   | 14  | 97 2   | 64  | 44444              | 14  | 162                 | 64  | 741    |
| 15    | 6 5000   | 65    | 2 708333 | 15  | 1 417  | 65  | 45139              | 15  | 174                 | 65  | 752    |
| 16    | 666667   | 66    | 2 750000 | 16  | 011111 | 66  | 045833             | 16  | 000185              | 66  | 000764 |
| 17    | 7 8333   | 67    | 2 791667 | 17  | 11806  | 67  | 465 8              | 17  | 197                 | 67  | 775    |
| 18    | 75 000   | 68    | 833333   | 18  | 1 500  | 68  | 47 22              | 18  | 208                 | 68  | 787    |
| 19    | 791667   | 69    | 875 0    | 19  | 13194  | 69  | 47917              | 19  | 0                   | 69  | 799    |
| 20    | 833333   | 70    | 916667   | 20  | 13889  | 70  | 48611              | 20  | 231                 | 70  | 810    |
| 21    | 8750 0   | 71    | 958333   | 21  | 014583 | 71  | 049306             | 21  | 000243              | 71  | 000822 |
| 22    | 916667   | 72    | 3 000 00 | 22  | 15 76  | 72  | 500 0              | 22  | 255                 | 72  | 833    |
| 23    | 958333   | 73    | 3 041667 | 23  | 1597   | 73  | 50694              | 23  | 66                  | 73  | 845    |
| 24    | 1 0 00   | 74    | 3 83333  | 24  | 16667  | 74  | 51389              | 24  | 76                  | 74  | 856    |
| 25    | 1 41667  | 75    | 3 1 5    | 25  | 17361  | 75  | 5 83               | 25  | 83                  | 75  | 868    |
| 26    | 1 83333  | 76    | 3 166667 | 26  | 018 56 | 76  | 05 778             | 26  | 000301              | 76  | 000880 |
| 27    | 1 1 50   | 77    | 3 8333   | 27  | 1875   | 77  | 5347               | 27  | 31                  | 77  | 891    |
| 28    | 1 166667 | 78    | 3 500    | 28  | 19444  | 78  | 54167              | 28  | 324                 | 78  | 903    |
| 29    | 1 8333   | 79    | 3 91667  | 29  | 0139   | 79  | 54861              | 29  | 336                 | 79  | 914    |
| 30    | 1 5 0    | 80    | 3 333333 | 30  | 0633   | 80  | 55556              | 30  | 347                 | 80  | 926    |
| 31    | 1 91667  | 81    | 3 375 0  | 31  | 0 15 8 | 81  | 056 50             | 31  | 000359              | 81  | 000937 |
| 32    | 1 333333 | 82    | 3 416667 | 32  |        | 82  | 56944              | 32  | 370                 | 82  | 949    |
| 33    | 1 3750   | 83    | 3 458333 | 33  | 2917   | 83  | 57639              | 33  | 38                  | 83  | 961    |
| 34    | 1 416667 | 84    | 3 500000 | 34  | 23611  | 84  | 58333              | 34  | 394                 | 84  | 972    |
| 35    | 1 458333 | 85    | 3 54166  | 35  | 43 6   | 85  | 59028              | 35  | 405                 | 85  | 984    |
| 36    | 1 5 0    | 86    | 3 583333 | 36  | 250 0  | 86  | 0597               | 36  | 000417              | 86  | 000995 |
| 37    | 1 54 667 | 87    | 3 6 5    | 37  | 5694   | 87  | 60417              | 37  | 4 8                 | 87  | 1007   |
| 38    | 1 583333 | 88    | 3 666667 | 38  | 6389   | 88  | 61111              | 38  | 440                 | 88  | 1019   |
| 39    | 1 6 500  | 89    | 3 7 8333 | 39  | 7 83   | 89  | 61806              | 39  | 451                 | 89  | 1030   |
| 40    | 1 666667 | 90    | 3 75000  | 40  | 7778   | 90  | 62500              | 40  | 463                 | 90  | 1042   |
| 41    | 1 7 8333 | 91    | 3 791667 | 41  | 0 847  | 91  | 63194              | 41  | 00475               | 91  | 001053 |
| 42    | 1 75 0   | 92    | 3 833333 | 42  | 9167   | 92  | 63889              | 42  | 486                 | 92  | 1065   |
| 43    | 1 791667 | 93    | 3 8750 0 | 43  | 9861   | 93  | 64583              | 43  | 498                 | 93  | 1076   |
| 44    | 1 833333 | 94    | 3 916667 | 44  | 3 556  | 94  | 65 78              | 44  | 5 9                 | 94  | 1088   |
| 45    | 1 875 0  | 95    | 3 958333 | 45  | 31 50  | 95  | 6597               | 45  | 521                 | 95  | 1100   |
| 46    | 1 916667 | 96    | 4 000 0  | 46  | 31944  | 96  | 066667             | 46  | 000532              | 96  | 001111 |
| 47    | 1 958333 | 97    | 4 41667  | 47  | 3 639  | 97  | 67361              | 47  | 544                 | 97  | 1123   |
| 48    | 00 0     | 98    | 4 083333 | 48  | 33333  | 98  | 68056              | 48  | 556                 | 98  | 1134   |
| 49    | 4 667    | 99    | 4 1 5 0  | 49  | 34 28  | 99  | 6875               | 49  | 567                 | 99  | 1146   |
| 50    | 83333    | 100   | 4 166667 | 50  | 0347   | 100 | 069444             | 50  | 000579              | 100 | 001157 |

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